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Material Science & Technology Division
Oak Ridge National Laboratory
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RESEARCH INTERESTS

- Laboratory kinetics
- Interfaces in biology/energy/environment
- Microfluidics
- Aerosols
- Chemical imaging
- Mesoscale sciences
- Separation
- Applied toxicology
- CO₂ capture
- Instrument development
- Surface science
- Electrochemistry
- In situ, in vivo, in operando imaging
- Material characterization
- Field observations of atmospheric composition and evolution
- Personal exposure

HIGHLIGHTS

- Develop new capabilities for probing liquid interface using vacuum techniques
- In situ liquid and interface imaging using electron microscopy and surface spectroscopy
- Expertise in kinetic studies of complicated photochemical reactions (experiments/modeling)
- Discovery of new free radical reactions related to halogen activation in the aqueous phase
- Design, set up, and operate laboratory reactor with laser spectroscopy
- Design, construction, and integration of novel aerosol measurement instrument
- Expert at analytical techniques for aerosol and air pollutant measurements
- Extensive ground and airborne experiences with particulate measurements and data analysis
- Extensive exposure to modern analytical instrumentation
 - Extensive teaching and mentoring experience in undergraduate and graduate education

EDUCATION

Ph.D., Physical Chemistry, University of Michigan, Ann Arbor, MI, 2001

Dissertation title: “Kinetics of free radical reactions generated by laser flash photolysis of Cl⁻+OH and SO₄⁻+OH in the aqueous phase — chemical mechanism, kinetics data and their atmospheric implications”

Advisor: Professor John R. Barker

M.S., Chemistry, University of Michigan, Ann Arbor, MI, 1997

B.S. and Engineering, Beijing Polytechnic University, Beijing, China, 1994

Major: Inorganic Non-metallic Materials, Environmental Chemistry and Engineering

Thesis title: “High performance separation medium of a new spherical hydroxyapatite”

Advisor: Professor Xian-Zhen Yu

RESEARCH EXPERIENCE

2022-present Distinguished Scientist (V), Material Science & Technology Division (MSTD), Physical Sciences Directorate (PSD), Oak Ridge National Laboratory (ORNL)

Materials for Fusion and Fission Sciences

Clients: DOE Nuclear Energy (NE), Tritium S&T, Technology and Commercialization Fund (TCF-NE)

Risk Analysis and Consequence Assessment

Client: DOE NNSA Nuclear Safety and Security (AU31) Program

In Situ, Operando Multimodal Imaging

Client: ORNL Strategic LDRD

2020-2022 Chief Engineer (V), Energy Processes & Materials Division (EPMD), Energy and Environment Directorate (EED), Pacific Northwest National Laboratory (PNNL)

Interfacial Sciences, Microfluidics, Material Characterization, and Separation

Clients: DOE Nuclear Energy (NE), Tritium S&T, Technology and Commercialization Fund (TCF-NE), DOE ICORPS (NE), DOD Strategic Environmental Research and Development (SERDP), Basic Energy Science (BES) Program, DOE Biological and Environmental Research (BER), and PNNL EED ML LDRD

Risk Analysis and Consequence Assessment

Clients: DOE NNSA Nuclear Safety and Security (AU31) Program, Emergency Management (NA41) Program, and PNNL EED ML LDRD

2019-2020 Senior Chemical Engineer (IV), EPMD, EED, PNNL

Material Characterization, Condensed Phase Phenomena, and Interfacial Molecular Science

Clients: Nuclear Energy (NE) Program, Tritium S&T Program, DOD SERDP, DOE BES Program, BER, and PNNL LDRD

2006-2019 Senior Research Scientist (III/IV), Earth and Biological Sciences Directorate (EBS), PNNL

Condensed Phase Characterization, Interfacial Molecular Sciences, and Microfluidics

Clients: DOE BES Program, BER, OE Program, and PNNL LDRD

- PI of the 2014 R&D 100 winner SALVI (System for Analysis at the Liquid Vacuum Interface);
- PI of the 2015 Federal Laboratory Consortium Technology Transfer Award of SALVI
- Invented the first vacuum compatible microfluidic cell to enable liquid imaging using SEM and ToF-SIMS;
- Led demonstrations of the new mesoscale imaging capability to study various liquid surfaces using vacuum based surface and ambient spectroscopic and microscopic techniques including SEM, ToF-SIMS, SIM, CLSM, NMR, synchrotron x-ray spectroscopy (e.g., hard XAS, soft XAS, XPS), and light microscopy;
- Invented the first electrochemical SALVI platform compatible for vacuum surface analysis and illustrated feasibility for studying the dynamic electrode-electrolyte interfaces with applications in electrical energy storage, cell dynamics, and heterogeneous catalysis;
- Led the capability development of correlative imaging of irradiated and nuclear materials
- Led the dynamic biological studies of SALVI in biofilm growth with potential applications in mitigation of polluted heavy metals of interest to energy and environment;
- Led the first correlative imaging of single mammalian cells of SALVI with potential applications in cancer studies;
- Led the development of the first micro battery SALVI for integration with SEM and ToF-SIMS for characterization of battery materials;
- Developed a new fast electrophoresis separation technique to determine state of charge (SOC) for vanadium redox flow batteries.

Emergency Management and Human Health

Client: DOE Emergency Management (NA 41) *Subcommittee on Consequence Assessment and Protective Actions (SCAPA)*

- Chair for the SCAPA chemical mixture working group (CMWG);
- Member of the DOE TEEL Advisory Guidance (TAG) committee;
- Led the development of the on-line chemical mixture methodology (CMM) tool, the CMM wizard;
- Led the continued method development of the CMM and contribute to PAC development;

- Conducted applied toxicology research for DOE NNSA and SCAPA
- Supervised the review of health code numbers for the CMM.

Waste Treatment

Clients: Washington River Protection Solutions (WRPS), Battelle *River Protection Project–Waste Treatment Plant* (RPP-WTP) Program, DOE Biological Environmental Research (BER), Atomic Energy of Canada Limited (AECL)

- Led the acute occupational exposure level assessment of toxic chemicals for the Hanford site;
- Led the stack effluent validation testing for the EMSL capability replacement project (Building 3410) for BER to meet the air permit requirements of the state of Washington;
- Provided technical support and guidance to effluent management and radionuclide measurement for Atomic Energy of Canada Limited (AECL);
- Conducted scale model experiments and implemented ANSI N13.1 to assess aerosol and gas mixing to meet the state of Washington air permit requirements; acted as the deputy project manager; managed projects; supervised testing staff;
- Conducted various CCP QA reviews to support various projects within the RPP-WTP program;
- Conducted slurry rheology measurements using various rheometers for M12 tests;
- Operated slurry simulant measurements for M3 including Ultrasonic Doppler Velocimetry, Ultrasonic Concentration and Density, and Pulse Echo Ultrasonic Attenuation for scaled pulsed jet mixing tests;
- Assisted measurement and scale-down design of vitrification plant tests for Task 9, scaled stack qualification testing.

Air Pollution and Global Climate Change

Clients: DOE Atmospheric System Research (ASR) Program (formerly Atmospheric Science Program (ASP) and Atmospheric Radiation Measurement (ARM) Climate Research Facility

- Led the airborne readiness demonstration of the Los Gatos Research ammonia spectrometer on G-1;
- Deployed advanced aerosol chemical and physical measurements including the Aerodyne Aerosol Mass Spectrometer (AMS), Sunset OCEC Field Analyzer, PSAP, PCASP, CPC, to study regional and global air pollution in Mexico City and Houston;
- Conducted AMS data reduction and analysis of field data including MACE, MILAGRO, and GOMAX;
- Published peer reviewed manuscripts to report scientific findings in past field campaigns;
- Created the Fast TRAC concept and spearheaded its development;
- Characterized and optimized the Sunset OCEC field analyzer;
- Set up the trace gas suite including O₃, SO₂, CO, and NO/NO₂/NO_x gas analyzers;
- Supported characterization and deployment of various cloud probes for the ARM Ariel Facility (AAF).

PNNL Atmospheric Science & Global Change Division (ASGC)

- Led strategic discussion and planning of the aerosol and trace gas instrument capability development at PNNL;
- Designed and set up the first aerosol chemistry laboratory for the ASGC division;
- Initiated and developed the ice chamber – CVI – single particle mass spectrometer concept to study ice nucleation for the laboratory-wide Aerosol Initiative.

Houston Advanced Research Center (HARC)

Client: HARC, TCEQ, AQR

- Originated the concept and assisted deployment of the Houston Triangle Field Campaign to study secondary organic aerosol formation, volatile organic compound emissions in Houston, TX in 2006 and deployed the study;

- Initiated radical induced secondary aerosol formation concept in 2009 as part of the SHARP campaign and lead deployment.

2004-2005 Research Scientist (Research Assistant Professor and then Research Associate Professor), Department of Atmospheric Science, Colorado State University

- Deployed in situ and ex situ aerosol chemical and physical measurements to study nitrogen and sulfur deposition in the United States;
- Deployed fog and cloud measurements to investigate their organic speciation and processing;
- Developed and applied capillary electrophoresis (CE) for aerosol chemical characterization of organic acid anions and inorganic ions using microchip CE;
- Developed chip based CE methods and systems for miniaturization of novel aerosol instrumentation development.

2002-2004 Postdoctoral Fellow, Department of Atmospheric Science, Colorado State University

Advisors: Prof. Jeffrey L. Collett, Jr. and Prof. Sonia Kreidenweis

- Conducted aerosol chemical characterization campaigns for visibility studies sponsored by National Park Service (NPS), IMPROVE network, and other environmental state agencies;
- Designed experiment and tested IMPROVE HNO₃ denuder efficiency;
- Developed new CE techniques to determine organic and inorganic speciation for near real-time aerosol chemical characterization.

2001-2002 Postdoctoral Research Associate, Atmospheric Sciences Division, Brookhaven National Laboratory

Advisor: Dr. Yin-Nan Lee

- Developed HPLC analytical methods, assembled, optimized, and deployed the dual PILS-IC-TOC system;
- Performed airborne and ground measurements to monitor tropospheric pollutants;
- Deployed and operated airborne formaldehyde detection system, PILS-IC, TOC, TEOM.

1996-2001 Graduate Research Assistant, University of Michigan

Advisor: Professor John R. Barker

- Discovered several important free radical reactions related to halogen activation in aqueous solutions using laser flash photolysis coupled with time-resolved laser spectroscopy;
- Unified existing reaction mechanisms related to Cl free radical chemistry in the aqueous phase;
- Modeled kinetics of homogenous photochemical reactions;
- Evaluated and updated radical reaction rate constants and equilibrium constants in solutions;
- Expert in the optical investigations of radical photochemical processes;
- Experienced in laser instrumentation and modern spectroscopy methods.

1995-1996 Summer Research Assistant, University of Michigan

Advisor: Professor Stephen Lee

- Studied growth and characterization of inorganic crystals;
- Studied X-ray crystallography and structural chemistry of semiconductors.

1994-1995 Research Assistant, Institute of Chemical Metallurgy, Academia Sinica, Beijing, China

Advisors: Professor Xian-Zhen Yu and Professor Chun-Yi Zhou

- Studied synthesis and characterization of HPLC column medium.

1993-1994 Undergraduate Research Assistant, Institute of Chemical Metallurgy, Academia Sinica, Beijing, China

Advisors: Professor Xian-Zhen Yu and Professor Chun-Yi Zhou

- Operated HPLC and practiced laboratory skills.

TEACHING EXPERIENCE

2006-present Postdoctoral, Graduate and Undergraduate Student Mentor

- Designed research projects, selected students, directed project, advised students, and published research findings in creditable peer reviewed journals;
- Mentored over 50 post doc researchers and students for PNNL SEE, DHS STEM, NSF STAR, DOE SULI programs.

2004-2005 Substitute Lecturer, Dept. of Atmospheric Science, Colorado State University

- Substitute teaching in Atmospheric Oxidation Processes 715;
- Mentored junior graduate students and postdoctoral researchers to conduct various projects.

1997-2000 Training Facilitator, Center for Research on Learning and Teaching, University of Michigan

- Created, led, and advised orientations for new and experienced graduate student instructors to teach in a multicultural diverse environment at the Univ. of Michigan

1995-1998 Graduate Student Instructor, University of Michigan

- Instrumentation of Advanced Analytical and Physical Chemistry, Chem. 480, 1998
- Advanced Physical Chemistry, Chem. 463, 1997
- General Chemistry Laboratory, Chem. 125, 1996
- General Chemistry Recitation, Chem. 130, 1995

1995 Lecturer, Beijing New Oriental University, Beijing, China

- TOEFL Listening Comprehension

INDUSTRIAL CONSULTING EXPERIENCE

2011-present SPI Supplies and Structure Probe Inc., West Chester, PA

- Advised on productization of the vacuum compatible microfluidic system for in situ SEM and ToF-SIMS; facilitated the wet cell II performance testing and integration to SEM;
- Demonstrated in situ SEM applications in biological systems and battery materials using the vacuum compatible microfluidic system invented by my team prior to licensing and commercialization;
- Published the first nanoparticle conjugated IgG results by SALVI in a peer reviewed journal.

2009-2013 Los Gatos Research, Mountain View, CA

- Led and advised on airborne deployment of ammonia spectrometer;
- Designed and conducted flight test of ammonia spectrometer based on quantum cascade laser spectroscopy;
- Published fieldability results in a peer reviewed journal.

2007-2012 Physical Optics Corporation, Torrance, CA

- Advised on atmospheric sampling issues
- Provided guidance in laboratory and field testing of new sensors, such as the Refractometric Porous Polymeric Ammonia Sensor and the microfluidic array sensor for monitoring water composition

2002-2005 Aerosol Dynamics Inc., Berkeley, CA

- Advised and conducted microchip CE sensor development in various cation, anion analysis;
- Provided results and periodic reports to prove microchip CE application as an aerosol sensor;
- Proposed and construct ideas for new aerosol sensor development;
- Contributed key technical contents for winning two proposals from NASA and EPA.

LIST OF FIELD MISSIONS AND BEAM LINE EXPERIMENTS

Ground

Aerosol Field Campaigns

1. The Study of Houston Atmospheric Radical Precursors (SHARP) campaign, TRAC (Time-Resolved Aerosol Collector), J(NO₂) filtered spectrometer and actinic flux radiometer, Sunset OCEC analyzer, and Lasair, April - May 2009, Houston, TX
2. The Houston Triangle Experiment, PTR-MS, AMS (ToF and Q), and trace gas analyzers including SO₂, CO, NO/NO₂/NO_x, and O₃, September 2006, Houston, TX,
3. MILAGRO, MAX-MEX, ToF-AMS, Sunset OC/EC, and PNNL aerosol rack, March 2006, Mexico City, Mexico,
4. Rocky Mountains National Park Nitrogen and Sulfur Deposition Pilot Study: aerosol physical and chemical characterization, August 2005, Rocky Mountains NP, CO
5. IMPROVE Special Nitrate Study: PILS-IC, URG annular denuder-filter packs, IMPROVE samplers, and MOUDI measurements
 - July and August 2004, Great Smoky Mountains National Park, TN
 - November 2003, Brigantine Wilderness, NJ
 - July 2003, San Geronio Wilderness, CA
 - May 2003, Grand Canyon National Park, AZ
 - April 2003, San Geronio Wilderness, CA
 - February 2003, Bondville, IL
6. 2001 NEOPS Study, PILS-IC-TOC measurements, Philadelphia, PA

Fog and Cloud Field Campaigns

1. November, 2004, Baton Rouge, LS, various bulk phase cloud collectors (single, dual, and triple size stages, CalTech model), and PVM
2. July and August, 2004, Great Smoky Mountains National Park, TN, simultaneous in situ particle and cloud sampling
3. June, 2004, San Diego, CA, various bulk phase cloud collectors (single, dual, and triple size stages, CalTech model), PVM, high volume sampler, PILS-IC, Sunset OCEC, Aethalometer, PAH sampler, and annular denuder/filter packs

Airborne

Aerosol Field Campaigns

1. 2002 NEAQS Study, G1 PILS-IC-TOC daytime measurements, Worcester, MA
2. 2002 NAOPEX Study, G1 PILS-IC-TOC nighttime measurements, Worcester, MA
3. 2001 PNW Air Quality Study, G1 formaldehyde daytime measurements, Seattle, WA
4. 2012, Test flight of a novel ammonia spectrometer, Pasco, WA

Synchrotron beamline experiment

1. Aug. 2014, hard x-ray absorption spectroscopy (XAS), near edge x-ray fluorescence analysis (XRF), National Synchrotron Light Source (NSLS), Brookhaven National Laboratory (BNL), Upton, NY.
2. July, 2015, Chemical dynamics beamline (9.0.2), Single photon ionization mass spectrometry, Advanced Light Source (ALS), Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA.
3. Feb, 2016, Chemical dynamics beamline (9.0.2), Single photon ionization mass spectrometry, Advanced Light Source (ALS), Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA.
4. Aug, 2016, Chemical dynamics beamline (9.0.2), Single photon ionization mass spectrometry, Advanced Light Source (ALS), Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA.
5. April, 2017, Chemical dynamics beamline (9.0.2), Single photon ionization mass spectrometry, Advanced Light Source (ALS), Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA.

COMMUNICATION EXPERIENCE

Languages	English, Chinese and German
2007	Interpreter between Chinese and English for the Battelle Memorial Institute
1999-2000	Graduate Student Representative, Research Policy Committee, University of Michigan
1993-1995	Guest Broadcast Reporter, Beijing People's Broadcasting Station, Beijing, China
1990-1994	Broadcasting Program Manager, Beijing Polytechnic University, Beijing, China

COMPUTER AND LABORATORY SKILLS

Computer Operating Systems	Macintosh, Windows, and Unix
Software	KaleidaGraph, IgorPro, LabView, Microsoft Word and Excel, Canvas, Systat, Spyglass, Netscape, Adobe Illustrator, EndNote, Origin and Gaussian
Programming Languages	FORTRAN and BASIC
Instrumentation	NMR, HPLC, IC, CE, GC-MS, AA, UV/VIS, X-ray, Laser, TOC, MOUDI, URG Sampler, IMPROVE aerosol sampler, TEOM, AMS, PILS-IC, APS, SPMS, various chemiluminescence trace analyzers, various aerosol samplers, and rheometers
Physical Techniques	Setup, operation, maintenance and repair of Excimer lasers, electronic equipment, optics, PILS, FA monitor system, and setup and operation of air pollutant field monitor station
Chemical Techniques	Inorganic synthesis, and chemical analysis (wet and instrumental)
Other skills	Mechanical drawing and design, and mechanic shop work

AFFILIATIONS

- American Vacuum Society (2013 – present)
- American Chemical Society (1999 – present)
- American Nuclear Society (2021 – present)
- American Geophysical Union (2000 – 2012)
- Sigma Xi – The Scientific Research Society (2000 – 2010)
- IEEE (2007 – 2010)

AWARDS AND HONORS

2023	Fellow of the American Vacuum Society
2022	PNNL Outstanding Performance Award (OPA)
2021	PNNL Recognition Awardee, Path to Success (Editorial Board and issued patent)
2021	PNNL IP Commercialization Recognition and Reward Program, Universal liquid sample device and process for high-resolution transmission electron microscopy imaging and multimodal analyses of liquid sample materials, Path to success patent award, spring and fall
2020	PNNL Energy and Environment Directorate (EED), Exceptional contributions to the cover article for Surface and Interface Analysis and work for the Engineered Barrier Systems (EBS) project outstanding project performance award, July 2020
2020	PNNL IP Commercialization Recognition and Reward Program for U.S. Patent No. 10,598,609 - Universal liquid sample device and process for high resolution transmission electron microscope imaging and multimodal analyses of liquid sample materials - issued 3/24/2020
2020	PNNL EED, Mesofluidic Separation outstanding project performance award, Jan, 2020.
2018	PNNL National Security Directorate (NSD) Q3 Carabiner Award for New DOD PIs
2017	PNNL EED Project Team Award
2016	PNNL IP Commercialization Recognition and Reward Program for U.S. Patent No. 9,274,059- Microfluidic electrochemical device and process for chemical imaging and electrochemical analysis at the electrode-liquid interface in-situ - issued 03/01/2016

- 2016 PNNL IP Commercialization Recognition and Reward Program for SALVI Licensed to Industrial Partners
- 2015 PNNL EBSD Team Collaboration Award
- 2015 PNNL EBSD Exceptional Contributions to Program Award for winning the FLC award
- 2015 PNNL FCSD Staff OPA for making the Catalysis Science & Technology cover article
- 2015 PNNL FCSD Staff OPA for SALVI commercialization
- 2015 PNNL IP Commercialization Recognition and Reward Program for SALVI FLC award
- 2015 PI of the Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer (Analytical Instrument): “SALVI: System for Analysis at the Liquid Vacuum Interface”
- 2014 PI of the R&D 100 Award (Analytical Instrument): “SALVI: System for Analysis at the Liquid Vacuum Interface”
- 2014 PNNL FCSD Exceptional Contributions to Program Award for SALVI innovations
- 2014 DOE Pulse Featured Scientist, <http://web.ornl.gov/info/news/pulse/no418/profile.shtml>
- 2014 PNNL FCSD Staff OPA for leading SALVI development
- 2014 PNNL IP Commercialization Recognition and Reward Program for SALVI R&D 100 Award
- 2013 PNNL IP Commercialization Recognition and Reward Program for the issued SALVI patent
- 2012 PNNL Technology Commercialization Champions for SALVI industrial licensing
- 2008 PNNL Staff OPA for the RPP-WTP M3 project
- 2006 PNNL Staff OPA for the Houston Triangle Experiment
- 2000 Michigan Teaching Fellow, University of Michigan
- 2000 Michigan Graduate Student Travel Fund, University of Michigan
- 1999 Graduate Student Sloan Fellow, American Sloan Foundation
- 1993 Silver Medal, Beijing University Students’ English Contest
- 1992-1994 Award of Excellence in Broadcasting Programs, Beijing Polytechnic University

FUNDING

Proposals Awarded

1. *Sept. 2023 – Aug. 2026* DOE FES ML FOA, Accelerating discovery and diagnostics of plasma-wall interactions using machine learning, PIs: Xinghang Zhang, Guang Lin, Yexiang Xue, Haiyan Wang (Purdue); Xiao-Ying Yu, Guannan Zhang, Tim Graening (ORNL), **\$850,000**
2. *Sept. 2023 – Aug. 2026* DOE FES RENEW, Research training pathway for underrepresented minority students in advancing manufacturing for fusion power, PIs: Vijay K. Vasudevan (UNT), Xiao-Ying Yu (ORNL), Me-Ann Villanueva (PNNL), and Nicolas Argibay (Ames), **\$150,000** (ORNL)
3. *July 2023 – Jun. 2025* DOE NNSA NSR&D Environment, Health, Safety, and Security Program, Machine-Learning (ML) assisted atmospheric hazard modeling for effective geospatial risk analysis, PI: Xiao-Ying Yu, **\$500,000**
4. *March 2023 – present* DOE FES, Determination of transmutation isotopic products from irradiated tungsten, PI: Xiao-Ying Yu, **\$100,000**.
5. *June 2022 – present* ORNL Strategic LDRD, Correlative chemical imaging for advanced materials, PI: Xiao-Ying Yu, **\$585,500**.
6. *Nov. 2021 – Sept. 2022* DOE, Tritium S&T program, Axial tritium and lithium transport along TPBAR cladding and cruciforms, PI: Xiao-Ying Yu, **\$100,000**.
7. *Nov. 2020 – Sept. 2022* DOE, Tritium S&T program, Investigating hydrogen isotope exchange reactions on lithium aluminate pellets in TPBAR, PI: Jiyoung Son, Co-PI: Xiao-Ying Yu, **\$100,000**.
8. *Oct. 2021 – March 2022* DOE Energy I-CORPS Cohort 13, Nuclear Energy, Mesofluidic bump arrays for efficient particle separation in wastewater, PI: Xiao-Ying Yu, **\$75,000**.
9. *Oct. 2021 – March 2023* DOE, TCF Office of Technology Transitions, MEMS-enabled in operando spectroscopy and imaging during heating, PI: Xiao-Ying Yu, **\$200,000**.
10. *Nov. 2020 – present* DOE, Tritium S&T program, Tritium and lithium transport in the irradiated TPBAR cladding, getter and pellet, PI: Xiao-Ying Yu, **\$100,000**.

11. *Sept. 2019 – present* DOE NE Spent Fuel Engineered Barrier Systems (EBS): Uranium Oxide Electrochemical Testing, PI: Edgar Buck, Task Lead: Xiao-Ying Yu, ~**\$550,000** annually
12. *May 2020 – present* DOE NA41, Providing technical support for maintaining and developing the PAC and CMM tool, PI: Xiao-Ying Yu, **\$399,000** (FY20), **\$465,000** (FY21), **\$465,000** (FY22)
13. *March 2020 – present* DOE NA41, Providing technical support to the STARS working group and EMISIG, PI: Xiao-Ying Yu, **\$100,000** annually
14. *Sept. 2020 – Sept. 2023* DOE BES, Making an inorganic analogue of a cell for direct air capture, DOE BES Direct CO₂ capture, PI: Roger Rousseau, Co-PIs: David Hildebrandt, Xiao-Ying Yu, et al., **\$4,500,000**.
15. *Sept. 2020 – Sept. 2022* DOE NNSA AU31 NSR&D Program, Enhancing risk analysis of accidental release using CFD modeling and machine learning, PI: Xiao-Ying Yu, **\$500,000**
16. *March. 2020 – Jun. 2022* DOD SERDP, Selective Atmospheric Plasma Coating Removal (APCR) for Composite Substrates (WP20-1174), PIs: Peter Yancey, Xiao-Ying Yu et al., **\$250,000**
17. *Sept. 2020 – Sept. 2021* PNNL Quick Starter, Characterizing microbially influenced corrosion in plastics, PI: Xiao-Ying Yu, **\$10,000**
18. *May 2020 – Sept. 2020* PNNL EBSD Small LDRD, Modeling molecular signatures of extracellular electron transfer of microbial nanowires, PI: Xiao-Ying Yu, **\$10,000**
19. *Nov. 2020 – Sept. 2021* DOE NA41, Core technical grant for key development, PI: Xiao-Ying Yu, **\$500,000**
20. *Feb. 2020 – Sept. 2021* PNNL EED LDRD, Probability and trajectory forecasting of weather conditions on power consumption anomalies, PI: Xiao-Ying Yu. **\$50,000**
21. *Nov. 2019 – Sept. 2020* DOE, Tritium S&T program, Investigating Tritium and Lithium Transport in the Irradiated TPBAR Cladding and Getter, PI: Xiao-Ying Yu, **\$100,000**
22. *Oct. 2019 – Sept. 2020* WRPS, IDAV, Tasks 1-6, Task 6 lead: Xiao-Ying Yu, **\$1,500,000**
23. *Sept. 2018 – Sept. 2019* WRPS, Health Code Number development for the vapor project, Task lead: Xiao-Ying Yu, **\$300,000** of ~\$800,000; Data mining for IDAV, **\$100,000** of \$1,000,000
24. *April. 2019 – Sept. 2019* PNNL, EBSD Mission Seed LDRD, Exploring microbial nanowire by in operando imaging, PI: Xiao-Ying Yu, **\$30,000**
25. *Sept. 2018 – Sept. 2020* DOE NE EBS, Corrosion in EBS, PI: Edgar Buck, Task Lead: Xiao-Ying Yu, **\$500,000** annually
26. *Feb. 2019 – April. 2020* PNNL, NPSI LDRD, Carbonaceous material characterization in TPBAR, PIs: Walter Luscher, Xiao-Ying Yu, et al., **\$180,000**
27. *Oct. 2018 – Sept. 2019* US Department of State (DOS), Chemical Security Program (CSP), Tactical training on chemical exposure and medical countermeasure in Philippines, PIs: Mariefel Olarte and Xiao-Ying Yu. **\$199,000**
28. *March. 2018 – Sept. 2019* DOD SERDP, Revealing bilgewater emulsion formation and breaking by in situ multiplexed chemical imaging and microfluidics (WP18-1660), PI: Xiao-Ying Yu. **\$200,000**
29. *March. 2018 – Sept. 2018* EMSL Strategic Science Area (SSA) (User Project 50170), Understanding the interactions of the plant root and plant growth promoting bacteria with unique correlative surface imaging tools, PI: Zihua Zhu and Xiao-Ying Yu. **\$50,000**
30. *March. 2018 – Sept. 2018* PNNL SSA (User Project 50160), Elucidating synergistic plant-bacteria metabolic pathways for alleviating iron deficiency, PIs: Rena Boiteau, Amir Ahkami, Rosalie Chu, Alice Dohnalkova, David Hoyt, Dehong Hu, Lye Meng Markillie, Vaithiyalingam Shutthanandan, Xiao-Ying Yu, Zihua Zhu. **\$62,000**
31. *March. 2018 – Sept. 2019* PNNL EED LDRD, Mesofluidic separation of large particles in waste slurries, PIs: Leonard Pease, Xiao-Ying Yu, Matt Fountain, Mike Minette. **\$100,000**
32. *March. 2018 – Sept. 2018* PNNL Quick Starter, Illustrating SIMS imaging of the corrosion process at the metal-paint coating interface, PI: Xiao-Ying Yu. **\$17,000**
33. *Feb. 2018 – Sept. 2019* PNNL TIP FDF, Enabling versatile liquid surface nanoanalysis in near ambient pressure x-ray photoelectron spectroscopy (APXPS) via SALVI, PI: Xiao-Ying Yu. **\$20,000**
34. *Jan. 2018 – Sept. 2018* PNNL TIP FDF, Accelerating SALVI integration with new MS-MS imaging capabilities, PI: Xiao-Ying Yu. **\$12,000**

35. *Oct. 2017 – Sept. 2018* PNNL Quick Starter LDRD, Accurate detection of explosives in fingerprints using image fusion of SIMS and optical microscopy, PI: Xiao-Ying Yu. **\$15,000**
36. *Oct. 2017 – April. 2018* PNNL National Security Division Tactical Opportunity Pool (TOP) program development, A more efficient approach for environmental sample preparation and analysis, PI: Xiao-Ying Yu. **\$30,000**
37. *Oct. 2017 – Sept. 2018* US Department of State (DOS), Chemical Security Program (CSP), Tactical training on chemical exposure and medical countermeasure in Turkey, PI: Xiao-Ying Yu. **\$180,000**
38. *Oct. 2017 – Sept. 2018* US Department of State (DOS), Chemical Security Program (CSP), Expand and enhance vulnerability assessment training for chemical companies and universities in India and Bangladesh, PIs: Radha Kishan Motkuri, Cliff Glantz, and Xiao-Ying Yu. **\$190,267**
39. *Oct. 2017 – Sept. 2018* PNNL Quick Starter LDRD, Accurate detection of explosives in fingerprints using imaging fusion of SIMS and optical microscopy, PI: Xiao-Ying Yu. **\$15,000**
40. *March 2016 – Dec. 2017* PNNL TIP FDF, Enabling versatile liquid surface nanoanalysis in near ambient pressure x-ray photoelectron spectroscopy (APXPS) via SALVI, PI: Xiao-Ying Yu. **\$20,000**
41. *Oct. 2016 – Sept. 2018* Washington River Protection Solutions (WRPS), Hanford Tank Farm Occupations Exposure and Risk Assessment PIs: Tom Brouns, Chuck Timchalk, Xiao-Ying Yu et al. **\$1,000,000** annually.
42. *Oct. 2016 – Sept. 2017* DOS, CSP, Develop and Implement a Sustainable Agrochemical Security Training Program in India: Team with Indian Partners to Conduct Back-to-Back Train-the-Trainer Workshops and Action Planning for Several Indian States. PIs: Radha Kishan, Clifford Glantz and Xiao-Ying Yu. **\$173,492**
43. *March 2016 – April 2017* Proctor and Gamble, Biofilm surface analysis, PI: Xiao-Ying Yu. **\$45,000**
44. *Jan. 2016 – April 2018* PNNL Environmental & Biological Sciences Directorate (EBSD) Seed LDRD, Unveiling the dynamic microbial biofilm and plant root interface under extreme conditions, PI: Xiao-Ying Yu. **\$400,000** (FY16: **\$150,000**, FY17: **\$200,000**, FY18: **41,500**)
45. *Aug., 2017 – Sept. 2017* Battelle Technology Assistance Program (TAP), Assisting SPI for technology transfer of the SALVI liquid probe, PI: Xiao-Ying Yu. **\$4,000**
46. *Aug., 2016 – Sept. 2016* Battelle Technology Assistance Program (TAP), Assisting SPI for technology transfer of the SALVI liquid probe, PI: Xiao-Ying Yu. **\$4,000**
47. *April 2015 – Sept. 2016* PNNL Technology Investment & Maturation, Universal liquid TEM microfluidic cells based on SALVI for predictive materials, PI: Xiao-Ying Yu. **\$135,000** (FY15: **\$60,000**, FY16: **\$75,000**)
48. *Dec. 2013 – Sept. 2016* Battelle Technology Assistance Program (TAP), Assisting SPI for technology transfer of the SALVI liquid probe, PI: Xiao-Ying Yu. **\$50,000**
49. *Oct. 2015 – Sept. 2016* US Department of State (DOS), the Chemical Security Program (CSP), Vulnerability assessment tools and training to prevent and deter terrorist attacks involving weaponizable chemicals in India, PIs: Clifford Glantz and Xiao-Ying Yu. **\$160,502**
50. *March 2008 – Sept. 2016* DOE NA-41 Emergency Management, Consequence assessment using the chemical mixture methodology, CMM program lead: Xiao-Ying Yu, ~**\$400,000** annually
51. *April 2015 – June 2018* PNNL Radiological Processing Science Initiative, Laboratory Directed Research & Development, PIs: Richard Daniel, Jaehun Chun, Dongsheng Li, and Xiao-Ying Yu. **\$915,000** (FY15: **\$115,000**, FY16: **\$325,000**, FY17: **\$325,000**, and FY18: **150,000**)
52. *Oct. 2015 – Sept. 2016* PNNL MS³ Initiative, Thrust I: Nanocomposite particle synthesis using switchable ionic liquids, PIs: David Heldebrant, Xiao-Ying Yu, and Satish Nune. **\$590,000** (FY16: **\$250,000**, FY17: **\$250,000**; FY18: **90,000**)
53. *Oct. 2013 – Sept. 2015* PNNL MS³ Initiative, Thrust I: Nanocomposite particle synthesis using switchable ionic liquids, PIs: David Heldebrant, Xiao-Ying Yu, and Satish Nune. **\$500,000** (FY14: **\$250,000**, FY15: **\$250,000**)

54. *Sept. 2014 – April 2016* Atomic Energy of Canada Limited (AECL), Technical assistance to AECL for the replacement of the NRU reactor stack effluent monitor, PIs: John Glissmeyer, Xiao-Ying Yu, and Julia Flaherty. **\$760,000**
55. *Aug. 2014 – Dec. 2014* EMSL, Hardening the SALVI E cell using ToF-SIMS, PIs: Zihua Zhu and Xiao-Ying Yu. **\$50,000**
56. *Oct. 2013 – Dec. 2014* Battelle Technology Quick Deployment Funds, Applying the microfluidic probe for in situ imaging of complex liquids, PI: Xiao-Ying Yu. **\$70,000**
57. *Oct. 2012 – Sept., 2015* PNNL Chemical Imaging Initiative, Structure and dynamics of biological systems, PI, James Evans, Co-PI: Xiao-Ying Yu, Denny Perea, and Zihua Zhu, \$ **1,165,000** (FY14: **\$410,000**, FY15: **\$410,000**, FY16: **\$345,000**)
58. *July. 2012 – June., 2013* Environmental Molecular Sciences Laboratory (EMSL, PNNL), N₂O Tracer Gas Instrument Upgrade, PI: Xiao-Ying Yu. **\$60,000**
59. *July. 2012 – Sept., 2013* Pacific Northwest National Laboratory, Retesting of the 3410 building ventilation systems, PI: John Glissmeyer, Co-PI: Xiao-Ying Yu. **\$320,000**
60. *Jan. – Sept. 2012* Battelle Use at Facility Funds, A portable multimodal microfluidic flow cell for *in situ* imaging of liquid by ToF-SIMS and SEM, PI: Xiao-Ying Yu. **\$33,000**
61. *Dec. 2010 – Dec. 2012* DOE SBIR Phase II, Deployment of an airborne ammonia spectrometer, Subcontract from Los Gatos, PI: Xiao-Ying Yu. **\$65,000**
62. *Oct. 2008 – Sept. 2010* ARMY SBIR Phase II, In-Line Toxicity Monitoring (TOMO) System, Subcontract from Physical Optics Corporation, PI: Xiao-Ying Yu. **\$20,000**
63. *April 2008 – Sept. 2009* Houston Air Research Center (HARC), Air Pollution Program, Determination of Radical Sources and Precursors in Houston during SHARP, PIs: Xiao-Ying Yu and James P. Cowin. **\$70,400**
64. *Oct. 2007 – Dec. 2012* DOE ASP, Block Grant. ~ **\$100,000/yr**
65. *Oct. 2007 – Sept. 2008* DOE ARM, ARM Ariel Vehicle Facility, Block Grant. ~ **\$20,000/yr**
66. *March 2007 – Sept. 2007* PNNL ASGC, The Aerosol Climate Initiative - Development of the Measurements and Instrumentation Roadmap, PI: Xiao-Ying Yu, **\$63,000**
67. *Oct. 2006 – July 2007* PNNL EMSL Science Theme Atmospheric Aerosol Chemistry, Development of Novel Microchip CE-MS Platform for Organic Aerosol Characterization (proposal ID 19831), PI: Xiao-Ying Yu. **\$15,000**
68. *July 2005 – April 2006* National Park Service, Fate and Origin of Nitrogen and Sulfur along the Colorado Front Range and Rocky Mountain National Park – A Pilot Study, PI: Jeff Collett; Co-PI: Xiao-Ying Yu. **\$72,583**

DOE User Facility Proposals Awarded

1. *Nov. 2023 – Sept. 2024* PNNL EMSL Capability User Proposal (61024), Chemical imaging for in situ detection and discrimination of aquatic toxins targeting voltage gated sodium channels, PIs: Jiyoung Son, Xiao-Ying Yu, and Jennifer Moberley
2. *Oct. 2023 – Sept. 2025* PNNL EMSL Capability User Proposal (60770), Nutrient and contaminant incorporation in amorphous intermediates during carbonate nucleation and growth in biogeochemical systems, PIs: Sebastien Kersit, Xiao-Ying Yu, Sarah Saslow, Shawn Riechers et al.
3. *Feb. 2023 – Aug. 2024* ORNL CNMS User Proposal (CNMS2023-A-01909), Mapping irreversible chemical/structural change of cathode in solid-state batteries, PIs: Guang Yang, Xiao-Ying Yu et al.
4. *Feb. 2023 – Aug. 2024* ORNL CNMS User Proposal (CNMS2023-A-01926), Enabling in situ and operando ToF-SIMS and APXPS of liquids using microfluidics, PI: Xiao-Ying Yu
5. *Feb. 2023 – Aug. 2024* ORNL CNMS User Proposal (CNMS2023-A-01883), Three-dimensional chemical imaging of microbially induced corrosion on glass using correlative ToF-SIMS and AFM, PIs: Xiao-Ying Yu, Andrew Plymale, Luke Hanley, and Gabriel Parker

6. *Jan. 2023 – Sept. 2023* PNNL EMSL Capability User Proposal (60667), Chemical imaging for in situ detection and discrimination of aquatic toxins targeting voltage gated sodium channels, PIs: Jiyoung Son, Xiao-Ying Yu, and Jennifer Mobberley
7. *Oct. 2021 – Sept. 2023* PNNL EMSL Science Theme User Proposal (51915), Contaminant immobilization through heterogeneous carbonate growth at mineral/water and mineral/microbe interfaces, PIs: Sebastien Kersit, Xiao-Ying Yu, Sarah Saslow, Shawn Riechers et al.
8. *Oct. 2019 – Sept. 2020* PNNL EMSL General User Proposal (51176), Revealing bilgewater emulsion formation and breaking by in situ multiplexed chemical imaging, PI: Xiao-Ying Yu.
9. *Oct. 2019 – Sept. 2021* PNNL EMSL Science Theme User Proposal (50820), Contaminant immobilization through heterogeneous carbonate growth at mineral/water and mineral/microbe interfaces, PIs: Sebastien Kersit, Xiao-Ying Yu, Shawn Riechers et al.
10. *Oct. 2018 – Sept. 2019* PNNL EMSL General User Proposal (50569), Revealing bilgewater emulsion formation and breaking by in situ multiplexed chemical imaging, PI: Xiao-Ying Yu.
11. *March 2018 – Sept. 2018* PNNL EMSL Strategic Science Area (SSA) Proposal (50170), Understanding the interactions of the plant root and plant growth promoting bacteria with unique correlative surface imaging tools, PIs: Zihua Zhu and Xiao-Ying Yu.
12. *March 2018 – Sept. 2018* PNNL EMSL Strategic Science Area (SSA) Proposal (50160), Elucidating synergistic plant-bacteria metabolic pathways for alleviating iron deficiency, PIs: Rena Boiteau, Amir Ahkami, Rosalie Chu, Alice Dohnalkova, David Hoyt, Dehong Hu, Lye Meng Markillie, Vaithiyalingam Shutthanandan, Xiao-Ying Yu, Zihua Zhu.
13. *October 2017 – Sept. 2018* PNNL EMSL General User Proposal (50093), Deciphering electron transfer in microbial communications by in situ chemical imaging, PI: Xiao-Ying Yu.
14. *May 2016 – April 2019* LBNL ALS Approved Program Proposal (ALS-07554), Decoding structure and reactivity of heterogeneous interfaces through multi-modal chemical imaging, PIs: Vijayakumar Murugesan, Arun Devaraj, ..., Xiao-Ying Yu, Nigel Browning, and Karl Muller.
15. *October 2016 – Sept. 2018* PNNL EMSL Science Theme User Proposal (49300), Organic enrichment of sea spray aerosols: from the air-water interface to spray generation, PIs: Robert Walker, Hongfei Wang, Susannah Burrows, and Xiao-Ying Yu,
16. *October 2016 – Sept. 2017* PNNL EMSL General User Proposal (49694), Deciphering electron transfer in biofilm communications by in situ chemical imaging, PIs: Xiao-Ying Yu, James Fredrickson, and Haluk Beyenal.
17. *October 2015 – Sept. 2016* PNNL EMSL User Proposal (49430), Investigating interactions and aggregates structures of boehmite particles toward understanding of bulk rheology, PIs: J. C. Chun, R. C. Daniel, D. Li, and X.-Y. Yu.
18. *October 2015 – Sept. 2016* PNNL EMSL User Proposal (49143), In situ mesoscale imaging of biofilm dynamics using SALVI, PIs: X.-Y. Yu and M. J. Marshall.
19. *July 2015 – June 2017* LBNL ALS General User Proposal (ALS-07554), Probing nucleation, molecular structure and dynamics in the liquid phase, PIs: X.-Y. Yu and Vijayakumar Murugesan.
20. *October 2014 – Sept. 2015* PNNL EMSL User Proposal (48654), In situ mesoscale imaging of biofilm dynamics using SALVI, PIs: X.-Y. Yu and M. J. Marshall.
21. *October 2014 – Sept. 2015* PNNL EMSL User Proposal (48671), Correlative imaging and spectroscopy of biological systems and structural dynamics, PIs: J. Evans, X.-Y. Yu, Z. Zhu, and D. Perea.
22. *October 2013 – Sept. 2014* PNNL EMSL User Proposal (48143), Correlative imaging and spectroscopy of biological systems and structural dynamics, PIs: J. Evans, X.-Y. Yu, Z. Zhu, and D. Perea.
23. *October 2012 – Sept. 2013* PNNL EMSL User Proposal (47740), Correlative Imaging and Spectroscopy of Biological Systems and Structural Dynamics, PIs: J. Evans, X.-Y. Yu, Z. Zhu, and D. Perea.
24. *Jan. 2013 – Sept. 2014* SLAC Light Source User Proposal, Advanced Imaging of 2D Protein Crystals with LCLS CXI, PIs: F. Matthias and J. Evans, Collaborators: J. Abramson, M. Kukkadapu,

- E. Patello, D. Perea, X.-Y. Yu, S. P. Hau-Riege, G. Feld, R. A. Kirian, M. Bogan, M. S. Hunter, H. Benner, G. F. X., Schertler, B. Pedrini, M. A. Coleman, and X. Li
25. *Oct. 2012 – Sept. 2013* PNNL EMSL User Proposal (42407), Dynamics of biological systems, PIs: X.-Y. Yu and Z. Zhu.
 26. *Jan. 2012 – Sept. 2012* PNNL EMSL User Proposal (47299), A portable multimodal microfluidic flow cell for in situ imaging of liquid by ToF-SIMS and SEM, PIs: Z. Zhu and X.-Y. Yu
 27. *March 2009 – Dec. 2012* PNNL EMSL User Proposal (42330), In Situ/Liquid Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS) for Environmental Interfaces, PIs: J. Cowin, M. Iedema, L. Yang, Z. Zhu, and X.-Y. Yu
 28. *March 2007 – Sept. 2009* PNNL EMSL Science Theme Atmospheric Aerosol Chemistry, Ice Nucleation on Aged Field Aerosols, PIs: J. Cowin, M. Iedema, A. Hashim, and X.-Y. Yu

Proposals under Review

1. Feb. 19, 2024, DOE ORNL CNMS user proposal, Chemical transformation of synfuel oxidation at the nanoscale, PI: Xiao-Ying Yu, (FY24)
2. Oct. 27, 2024 DOE NE CINR NSUF RTE, Nanoscale, multimodal imaging of irradiated baffle-former bolts for understanding IASCC, PI: Xiao-Ying Yu, **\$50,000** (FY24)
3. July, 2023, ORNL Seed LDRD, Multimodal imaging of the dynamic electrode-electrolyte interface, PI: Xiao-Ying Yu, **\$190,000** (FY23)
4. June, 2023, DOE NE Spent Fuel program, Synfuel irradiation effect testing, PI: Xiao-Ying Yu, Jeff Fortner, **5150,000** (FY24)

Proposals not funded

1. Oct. 11, 2022, DOE NE CINR NSUF 1.1 pre-app & SOW, Nanoscale, multimodal imaging of irradiated baffle-former bolts for understanding IASCC, PI: Xiao-Ying Yu, **\$500,000** (FY24-FY26)
2. May 23, 2022, DOE BES FOA SC-FOA-0002763, In situ interfacial imaging of catalytic mechanisms of nitrogenase for rational design of novel catalysts, PI: Xiang Ma (Grand View Univ.), Co-PIs: Xiao-Ying Yu, **\$2,000,000** (FY23-FY26)
3. May 22, 2022, DOE WPTO Marine Energy Lab Call, Automated mCD and nitrogen sensing for aquaculture, PI: Xiao-Ying Yu, **\$300,000** (FY23-FY24)
4. July 18, 2022, ORNL TIP, Electrochemical MEMS Cells for In Situ SEM, STEM, and TEM, PI: Xiao-Ying Yu, **\$450,000** (FY23-FY24)
5. June 16, 2022, NIH, Nanoscale and mass spectral imaging of biofilm adhesion in a microfluidic zero-resistance ammeter, PI: Xiao-Ying Yu, **\$593,577** (2023-2024)
6. April 4, 2022, DOE BER FOA SC-FOA-0002602, Mass Spectrometric Imaging of Metabolite Pathways in Fungi Model Systems, PI: Luke Henley (Univ. Illinois, Chicago), Co-PIs: Katharine Tibbetts (Virginia Commonwealth Univ.) and Xiao-Ying Yu, **\$2,250,000** (FY22-FY25)

INTELLECTUAL PROPERTIES

Granted US Patents

1. Universal liquid sample device and process for high resolution transmission electron microscope imaging and multimodal analyses of liquid sample materials, disclosure record number 31041-E, Xiao-Ying Yu, Libor Kovarik, and Bruce Arey, Battelle IP report filed in October, 2016. US Patent publication number US20170213692 A1 7, Application number: US 15/483,939. US 10,598,609 B2 granted 03/24/2020.
2. Studying liquid surfaces under vacuum using ToF-SIMS and SEM via a microfluidic interface, disclosure record number 16961-E, Xiao-Ying Yu, Yang Li, James Cowin, Martin Iedema, and Zihua Zhu, Battelle IP report filed in January, 2011; US patent application 13/047,025 was filed on 03/14/2011 and US patent 8,555,710 was awarded on 03/01/2016.

3. A microfluidic electrochemical platform for in situ chemical imaging of electrode-liquid interface, disclosure record number 30444-E, Xiao-Ying Yu, Bingwen Liu, Zihua Zhu, and Yang Li, Battelle IP report filed in July, 2013; US patent (14/050,144) was filed on 10/09/2013, US patent US20140038224 A1 published on 2/6/2014, and US20140038224 B issued on 3/1/2016, patent issued on 7/22/2019.

Invention Reports and Applied US Patents

4. Electrochemical MEMS Cells for In Situ SEM, STEM, and TEM, ORNL Invention Disclosure ID# : 202205152, Xiao-Ying Yu (ORNL)
5. In Operando Heating and Cooling with Simultaneous Chemical Imaging, Invention Disclosure ID# : 202205138, Xiao-Ying Yu (ORNL)
6. A geospatial risk analysis tool for identifying hazardous chemical emission sources, disclosure record number 18174, Hongfei Hou, Huiying Ren, Patrick Royer, and Xiao-Ying Yu (PNNL)
7. Separator assemblies and methods, disclosure record number 31482-E, Leonard Pease, Xiao-Ying Yu, Timothy Veldman, Matthew Fountain, Michael Minette, Carolyn, Burns, Nathan Phillips, and Jason Serkowski, Battelle IP. US Patent No. 62/824,925 (03/27/19), 62/832,790 (04/11/2019).
8. In situ microfluidic reactor for correlative imaging and dynamic spectroscopy, disclosure record number 30767-E, Xiao-Ying Yu and Ryan Renslow, Battelle IP report filed in May, 2015.
9. Fast determination of state of charge of Vanadium redox flow battery by isotachopheresis, disclosure record number 30478-E, Xiao-Ying Yu, Bingwen Liu, Wei Wang, Zimin Nie, and Vince Sprenkle, Battelle IP report filed in September, 2013.
10. Fast Time-Resolved Aerosol Collector ("Fast-TRAC"), disclosure record number 15752-E, James Cowin, Xiao-Ying Yu, and Hashim Ali, Battelle IP report filed in September 2007; provisional patent filed in December, 2007
11. Studying liquid surfaces under vacuum using ToF-SIMS and SEM via a microfluidic interface, disclosure record number 16961-E, Xiao-Ying Yu, Yang Li, James Cowin, Martin Iedema, and Zihua Zhu, Battelle IP report filed in January, 2011; Patent Cooperation Treaty (PCT, PCT/US12/20136) was filed on 01/4/2012.

LICENSED TECHNOLOGY

1. Exclusive Option Agreement No. 526340, Battelle and SPI Inc., Studying liquid surfaces under vacuum using ToF-SIMS and SEM via a microfluidic interface, disclosure record number 16961-E, Xiao-Ying Yu, Yang Li, James Cowin, Martin Iedema, and Zihua Zhu, Battelle IP report filed in January, 2011; US patent 13/047,025 was agreed and signed on 03/14/2013.
2. Exclusive Option Agreement No. 526340, Battelle and SPI Inc., Studying liquid surfaces under vacuum using ToF-SIMS and SEM via a microfluidic interface, disclosure record number 30444-E, Xiao-Ying Yu, Bingwen Liu, Zihua Zhu, and Yang Li, Battelle IP report filed in July, 2013; US patent US20140038224 B was agreed and signed on 03/14/2013.

PROFESSIONAL SOCIETY LEADERSHIP

1. American Chemical Society, Division of Analytical Chemistry, Interim Secretary, since Sept. 2020
2. American Chemical Society, Division of Environmental Chemistry, Membership committee, since 2014
3. American Vacuum Society, Pacific Northwest Chapter, Chair, 2021 – 2022; board member since 2019

EDITORIAL AND REVIEW BOARD MEMBER

1. International Journal of Current Toxins Research, Revotech Press since 2017
2. International Journal of Toxicology and Risk Assessment, ClinMed International Library since 2017

3. Micromachines, Editorial Board member, MDPI publisher, June 2019 – present
4. Atmosphere, Review Board member, MDPI publisher, March 2020 – present
5. ASTM PFAS Task group 2 committee member, Nov. 2020 – present
6. Frontiers in Nuclear Engineering – Nuclear Materials, Associate Editor, Frontiers Publisher, Sept. 2021 – present
7. AIMS Environmental Science, Editorial Board member, Oct. 29, 2022 – present
8. Results in Engineering (RIE), Editorial Board member, March 1, 2022 - February 29, 2024
9. RIE, Special issue ““RINENG Emerging women investigators in Engineering”, April, 2022
10. Editor of Special Issue in “Advances in Secondary Ion Mass Spectrometry” of the Analytical Chemistry section of “Frontiers in Chemistry”, co-editors: Fuyi Wang, Lutao Weng, Zihua Zhu, and Haibo Jiang.

SYNERGISTIC ACTIVITIES

1. Book editors for credible publishers
 - 1.1. Advancement in Microfluidics and Its Applications, Intech
 - 1.2. In situ characterization of heterogeneous catalysis in the aqueous environment, World Science Publisher
 - 1.3. Chemical imaging: Fundamental Principles and Applications, Springer
 - 1.4. Municipal and Industrial Waste Disposal, Microfluidics and New Applications, InTech – Europe
2. Journal Reviewer for 40+ venues including
 - 2.1. Atmosphere; Atmospheric Chemistry and Physics; Atmospheric Measurement and Technology; Journal of Atmospheric Chemistry; Atmospheric Research; Air Pollution Research; Geochemical Transactions; Journal of Geophysical Research – Atmosphere; Atmospheric Environment; Atmospheric Research; Aerosol and Air Quality Research; Photochemistry and Photobiology
 - 2.2. Chemosphere; CLEAN Soil, Air, Water; Environmental Engineering and Management Journal; Journal of Environmental Radioactivity; Journal of Hazardous Materials; Journal of Water Process Engineering; Environmental Pollution; Environmental Science & Technology; Applied Toxicology; ACS ES&T Water
 - 2.3. Analytical Chemistry; Analyst; Lab Chip; Analytica Chimica Acta; Micromachines; Nanoscale; Nanomaterials; Biosensors; JOVE; Biotechnology and Bioengineering; ACS Infectious Diseases
 - 2.4. Advanced Materials Interface; Frontier of Nanotechnology– Nanomaterials; Surface Science; Surface Interface Analysis; Journal of Materials Research and Technology; Scientific Report; Colloids and Surfaces A: Physicochemical and Engineering Aspects; Applied Surface Science
 - 2.5. RSC Advances; Phys. Chem. Chem. Phys.; Journal of Physical Chemistry (A); Chemical Physics Letters; Nature Communications Chemistry; ACS Nano; ACS Applied Materials & Interfaces; The Journal of Physical Chemistry A
 - 2.6. Journal of The Electrochemical Society; Chemical Engineering and Process Techniques; ACS Industrial & Engineering Chemistry Research; Chemical Engineering Journal Advances
3. Reviewer for DOE (BER SBIR and BES Early Career Award), Netherlands Organization for Scientific Research (NWO)
4. Review panels
 - 4.1. NASA Planetary Program PICASSO rolling review panel, Feb. 2021, virtual
 - 4.2. NASA Planetary Program PICASSO review panel, UVVIS sub panel, Feb. 2019, Miami, FL
 - 4.3. NSF Panel Review for Major Research Instruments (MRI), Chemical Process Systems, April, 2020, virtual video reviews.

- 4.4. DOE EERE BETO Review of FOA DE-FOA-0002396 for Bioprocessing and Separations, July 2021, virtual video reviews.
- 4.5. NSF Panel Review for Major Research Instruments (MRI), April, 2023, virtual video reviews.
5. Reviewer for the IPCC 2011 report Chapter 2 (Observations) and Chapter 7 (Clouds and Aerosols).
6. DOE Working Groups and Committees
 - 6.1. Chair of the DOE Chemical Mixture Working Group and Committee member of the DOE TEEL (temporary emergency exposure limit) (2011-2018)
 - 6.2. Chair of the DOE Chemical Exposure and Mixture Working Group and Committee member of the DOE Office of Emergency Management's Subcommittee on Technical Analysis and Response Support (STARS) since Feb. 2018.
 - 6.3. DOE TEEL Advisory Group (TAG) member, appointed by the DOE NNSA program manager since May 2015.
 - 6.4. DOE TEEL Expert Committee (TEC) member
7. Symposium chair, session organizer, and moderator
 - 7.1. Chair, "Chemical mixture methodology and its applications in emergency preparedness", 2011 IEEE Emergency Preparedness and Response Topical Meeting, Knoxville, TN, August, 2011.
 - 7.2. Chair, Tropospheric Aerosol Processes: The Physical and Chemical Aging of Aerosol Particles and Their Impacts II, Atmospheric Science, 2004 Fall American Geophysical Union National Meeting
 - 7.3. Chair, Frontiers in Atmospheric Instrumentation and Measurement V: Remote Sensing and Isotope Measurements, 2007 Fall American Geophysical Union National Meeting
 - 7.4. Convener, "Frontiers in Atmospheric Instrumentation and Measurement", co-convener, James Cowin. 2007 Fall American Geophysical Union National Meeting
 - 7.5. Biomaterial & Wet Interface Characterization (BI-TuM), Pacific Rim Symposium on Surfaces, Coatings and Interfaces (PacSurf 2014), Kohala Coast, HI, Dec. 7-11, 2014.
 - 7.6. Chair and session moderator, Advances in Analytical Spectroscopy Symposium, American Chemical Society National Meeting, Denver, CO, March 22-26, 2015.
 - 7.7. Chair and co-organizer of Focus Topic (FT) sessions, In situ spectroscopy and microscopy, 62nd AVS 2015, San Jose, CA, October 18-23, 2015.
 - 7.8. Chair and co-organizer of International SIMS XX in "In situ liquid SIMS", September, 2015, Seattle, WA.
 - 7.9. Chair and organizer of Imaging Mass Spectrometry symposium, Analytical Chemistry Division, ACS Fall national meeting, August, 2017, Washington, DC.
 - 7.10. Symposium organizer and chair of Surface Analysis, SciX meeting, September, 2016, Minneapolis, MN; October, 2017, Reno, NV.
 - 7.11. Chair of the symposium Surfaces & Interfaces in the Environment in honor of Vicki Grassian, ACS Fall national meeting, August, 2019, San Diego, CA.
 - 7.12. Symposium organizer for the 2018 Microscopy and Microanalysis symposiums including "Mesoscale correlative microscopy and imaging of physical, environmental, and biological sciences" (A06, 2016), "Low-energy electron and particle microscopies in liquid, gaseous, and frozen conditions" (A05, 2018), "Surface and subsurface microscopy and microanalysis" (A17, 2018), "Focused on microbes!" (B05, 2018), "Surface and subsurface microscopy and microanalysis" (A09, 2020), "Correlative microscopy and imaging of physical, environmental, and biological sciences" (B06, 2020), "Multi-Modal Multi-Dimensional Microscopy" (B06, 2021), "Correlative microscopy and imaging of physical, environmental, and biological sciences" (B06, 2022), "Surface and Subsurface Microanalysis" (A10, 2022)

8. ACS Society Activities
 - 8.1. ACS Environmental Chemistry Division Membership Committee member (2015 – present)
 - 8.2. ACS Analytical Chemistry Division Interim Secretary since 2020 (09/16/2020 – 12/31/2021)

9. AVS Society Activities
 - 9.1 Applied Surface Science Division
 - 9.1.1 Member since 2013
 - 9.1.2 Candidate for member-at-large in 2015
 - 9.2 Biological Interface Division
 - 9.2.1 Member since 2013
 - 9.3 Pacific Northwest Chapter
 - 9.3.1 Board member since 2019
 - 9.3.2 Program vice chair, 2021
 - 9.3.3 Program chair, 2022
 - 9.4 AVS International Meeting Program Development
 - 9.4.1 Focus topic symposium organizer, “Processing and Characterization of Gas-Liquid, Solid-Liquid, and Gas-Liquid Interfaces”, 2018 – 2019
 - 9.4.2 Focus topic symposium organizer, “Chemical Analysis and Imaging at Interfaces”, 2020 – present

10. FLC award committee member since 2015

11. ASTM International Standard Committee, Collaboration Area AC 421: PFAS Analytical and Sampling Task Group since March 2019

12. Invited Workshops
 - 12.1 DTRA Quantum Biology Workshop, Dec. 2021
 - 12.2 NSF The Mathematics of Soft Matter Workshop, Feb. 2022
 - 12.3 DOE NNSA EFCOG/NFS Workshop, Feb. 2022

STUDENTS AND STAFF ADVISED (80+)

Direct supervision and mentoring

Junior Staff

1. Sept. 2021 – present Jiyoung Son, S&E II, PNNL, In situ and in operando chemical imaging and new capability development
2. Sept. 2021 – present Xinming Lin, S&E II, PNNL, Machine learning in risk analysis
3. Sept. 2021 – present Hongfei Hou, S&E III, PNNL, Geospatial risk analysis software development
4. Dec. 2020 – present Huifen Zhou, S&E I, PNNL, Machine learning application in Hanford meteorological data
5. Dec. 2019 – present Huiying Ren, S&E III, PNNL, Machine learning in geospatial risk analysis
6. Sept. 2019 – present Xiao Sui, Assistant Professor, Shandong Normal University, Secondary organic aerosol formation
7. Dec. 2016 – Jan. 2021 Jenn Yao, S&E II, PNNL, CMM, SALVI fabrication, and in situ imaging of materials
8. Sept. 2016 – Nov. 2018 Rachel Komorek, Research Associate, PNNL, In situ SALVI imaging of microbial systems

Visiting Senior Research Faculty

9. Dec. 2018 – Nov. 2019 Cuiyun Yang, assistant professor, Chinese Academy of Sciences fellowship, Coastal Research Institute, Green algae electron transfer, Assistant professor, Yantai, Shandong, China
10. Sept. 2016 – Sept. 2017 Sandip Sabale, assistant professor, Indian RAMAN fellowship, Investigations on hyperthermia properties of Au@MFe₂O₄ core shell magnetic nanoparticles for effective cancer treatment application, Assistant professor at Dept. of Chemistry, Jaysingpur College, Maharashtra, India.

Postdoctoral Fellow

11. July 2021 – present Lyndi Strange, postdoctoral RA, ToF-SIMS, XPS, and electrochemical analysis of corrosion.
12. Sept. 2019 – present Fei Zhang, Zhejiang University, Secondary organic aerosol formation
13. July 2021 – May 2022 Jun Gao, postdoctoral RA, Interfacial characterization for direct air capture
14. Sept. 2020 – March 2022 Shalini Tripathi, postdoctoral RA, Multimodal analysis of irradiated materials
15. Jan. 2020 – Dec. 2021 Hongfei Hou, postdoctoral RA, meteorological data conversion and modeling
16. Aug. 2018 – Aug. 2021 Jiyoung Son, postdoctoral RA, In situ liquid SIMS imaging and SALVI development.
17. Jan. 2013 – Feb. 2015 Bingwen Liu, postdoctoral RA, PNNL, MS3, CII, In situ heterogeneous kinetics and imaging using novel microfluidic probes, now a postdoc at EMSL, PNNL.
18. Sept. 2010 – Sept. 2012 Li Yang, postdoctoral RA, PNNL, BES, Development of in situ liquid ToF-SIMS for interfacial studies, now a staff scientist at Evans Analytical Group., Sunnyvale, CA.
19. Nov. 2004 – Dec. 2005 Suresh Raja, postdoctoral RA, Dept. of Atmospheric Science, Colorado State University, Nitrogen deposition in the Rocky Mountains National Park – A Pilot Study; Continuous sampling of radiation fog in Baton Rouge, now an adjunct professor at Chemical Engineering at Louisiana State University and Air Quality Group Lead in ENERCON.

Postmaster

20. June 2018 – Aug. 2018 Tammy Pheuphong, M.S., Science Teacher, Infinity Science and Technology High School, Chicago, IL, ToF-SIMS analysis of plant seed interactions with plant-growth promoting bacteria.
21. July 2015 – Dec. 2016 Juan Yao, M.S., Washington State University, Tri-Cities, CMM development and Interfacial chemistry.
22. June 2016 – Aug. 2016 John Weisenfeld, M.S., Seattle Pacific University, Cornell University, Liquid SIMS data analysis, currently, secondary teacher in high school science, Pasco High School, Pasco, WA.

Graduate student

23. May 2023 – present Logan Howard, Ph.D. student, Bredesen Center, University of Tennessee, Knoxville, Metallic materials characterization using SIMS.
24. Aug. 2022 – present Gabriel Parker, Ph.D. student, University of Illinois, Chicago, Mass spectral imaging of PGPB and plant interactions, collaborating advisor: Luke Hanley.
25. Dec. 2018 – May 2023 Yuchen Zhang, Ph.D. student, School of Environmental Sciences, Huazhong Agriculture University, Wuhan, Hubei Province, P. R. China, PNNL ASF Program, Soil organic matter interactions, collaborating advisor: Prof. Yali Chen and Prof. Qiaoyun Huang.

26. Nov. 2018 – April 2023 Yanjie Shen, Ph.D. student, School of Environmental Sciences, Oceanic University, Qingdao, Shandong Province, P. R. China, PNNL ASF Program, Nanoparticle formation and surface interactions, collaborating advisor: Prof. Xiaohong Yao.
27. Sept. 2017 – Sept. 2018 Zhonghong Zhu, Ph.D. student, School of Environmental Sciences, Fudan University, Shanghai, P. R. China, PNNL ASF Program, Pyruvic acid surface reaction at the air-liquid interface, collaborating advisor: Prof. Jianmin Chen.
28. Nov. 2016 – Nov. 2017 Yao Fu, M.S. student, School of Environmental Sciences, Fudan University, Shanghai, P. R. China, PNNL ASF Program, Pyruvic acid surface reaction at the air-liquid interface, collaborating advisor: Prof. Jianmin Chen.
29. December 2015 – Nov. 2017 Fei Zhang, Ph.D. student, School of Environmental Sciences, Fudan University, Shanghai, P. R. China, PNNL ASF Program, Particle formation at the liquid surface, collaborating advisor: Prof. Jianmin Chen.
30. Dec. 2016 – June 2017 Rujia Yu, Ph.D. student, East China University of Science and Technology, P. R. China, PNNL ASF Program, In situ dynamic characterization of electrode-electrolyte interfaces, collaborating advisor: Prof. Fanghua Liu.
31. May 2016 – May 2017 Wenchao Wei, Ph.D. student, Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, P. R. China, PNNL ASF Program, In situ probing of interspecies electron transfer in co-cultured microbial communities, collaborating advisor: Prof. Fanghua Liu.
32. June 2016 – Aug. 2016 Shannon Fasing, graduate student, Virginia Commonwealth University, VA, NSF Star Program, Analysis of liquid ToF-SIMS data, Applying for a teaching position in science.
33. March 2015 – May 2016 Jiachao Yu, Ph.D. student, School of Chemistry and Chemical Engineering, Southeast University, Nanjing, P. R. China, PNNL ASF Program, Enzyme reactions at the interface of nanomaterials and biosensors, collaborating advisor: Prof. Songqin Liu.
34. February 2015 – Jan. 2016 Yuanzhao Ding, Ph.D. student, Interdisciplinary Graduate School, Nanyang Technological University, Singapore, PNNL ASF Program, Environmental stressors on biofilm formation and detachment, collaborating advisor: Prof. Bin Cao.
35. January 2015 – July 2016 Xiao Sui, Ph.D. student, Environment Research Institute, Shandong University, Jinan, P. R. China, PNNL ASF Program, Interfacial reactions of relevance to fog formation and secondary aerosol formation, collaborating advisor: Prof. Jianmin Chen.
36. March 2013 – April 2015 Xin Hua, Ph.D. student, School of Chemistry and Chemical Engineering, Southeast University, Nanjing, P. R. China, PNNL ASF Program, Electrochemistry at the interface of nanomaterials and aptamer, collaborating advisor: Prof. Songqin Liu.
37. May 2014 – June 2014 Sea Choi, M.S. student, University of Southern California, Los Angeles, CA, NSF STAR Intern and Noyce Scholar, Electrochemistry of the electrode electrolyte interface.
38. January 2013 – April 2013 Yulong Wang, M.S. student, College of Plant Protection, Nanjing Agricultural University, Nanjing, P. R. China, PNNL Alternative Sponsored Fellowship (ASF) Program, Fabrication of microfluidic and paper fluidic devices, collaborating advisors: Drs. Fanquan Liu and Limin Wang.
39. June 2012 – Aug. 2012 Sarah Horn, graduate student, University of Colorado, Boulder, CO, NSF STAR intern and Noyce Scholar, Further development of the Chemical Mixture Methodology (CMM) Wizard – An on-line tool.
40. June 2011 – March 2013 Alexander E. Booth, M.S. student, Western Washington University, Bellingham, WA, NSF STAR intern and Noyce Scholar, Migrating the CMM Workbook to a more robust and accessible ASP.net Wizard format, now a Physics Teacher at Central Kitsap High School, Silverdale, WA.
41. June 2011 – June 2015 Juan Yao, M.S. student, Washington State University, Tri-Cities, SCAPA Program Intern, M.S. Thesis “Developing the protective action criterion value and health code numbers for engineered carbon nanotubes and demonstrating potential applications in emergency preparedness”, defense in April, 2014.

42. June 2010 – July 2011 Hua He, M.S. student, Washington State University, Tri-Cities, SCAPA Program Intern, Development and review of Health Code Numbers, now at an Environmental Impact Assessor at Shanghai Academy of Environmental Sciences, Shanghai, China.
43. June 2008 – Feb. 2010 Donna Trott, M.S. student, Washington State University, Tri-Cities, SCAPA Program Intern, Development and review of Health Code Numbers, now a data administrator at the Colville Tribes Fish and Wildlife Department in Omak, WA.
44. August 2005 – Dec. 2005 Xinhua Shen, graduate student, Dept. of Atmospheric Science, Colorado State University, Nitrogen deposition in the Rocky Mountains National Park – A Pilot Study, now an assistant professor at University of Northern Iowa.

Undergraduate

45. May 2020 – Aug. 2020 Reilly Cannon, undergraduate student, Reed University, Portland, OR, DOE SULI program, Probability and trajectory forecasting of weather conditions on power consumption anomalies.
46. June 2018 – Aug. 2018 Angela Ossana, undergraduate student, University of Maryland, Baltimore, MD, DOE SULI program, In situ liquid SEM image analysis.
47. June 2018 – Aug. 2018 Hailey Dikeman, undergraduate student, University of Notre Dame, Notre Dame, IN, DOE SULI program, ToF-SIMS data analysis of fingerprint.
48. June 2016 – Aug. 2016 Rachel Elise Komorek, undergraduate student, Texas A&M University, College Station, TX, DOE SULI program, Liquid ToF-SIMS data analysis.
49. June 2015 – Aug. 2015 Rachel Elise Komorek, undergraduate student, Texas A&M University, College Station, TX, DHS HS-STEM Program, Improving the Chemical Mixture Methodology: Evaluating severity levels of respiratory irritants and their potential benefits, finishing BS degree in Food Sciences & Technology.
50. June 2017 – Aug. 2017 Luke Harrison, undergraduate student, Seattle Pacific University, Seattle, WA, DOE SULI, In situ VUV SPI-MS analysis of Li₂S₈ in a microfluidic electrochemical cell, currently finishing BS in chemistry.
51. June 2017 – Aug. 2017 Danielle Baur, undergraduate student, California State University, San Marcos, NSF Star Program, Comparative analysis of polyhedral oligomeric silsesquioxane, currently finishing BS in chemistry and biology.
52. June 2016 – Aug. 2016 Aala Al Hasan, undergraduate student, University of Houston, TX, NSF Star Program, Analysis of liquid SPI-MS data, currently finishing BS in chemistry and biology.
53. June 2015 – Aug. 2015 Lauren Fletcher, undergraduate student, San Francisco State University, San Francisco, CA, NSF Robert Noyce Teacher Scholarship Program, Improving the Chemical Mixture Methodology: Updating the CMM Wizard User's Guide and conducting test cases for CMM enhancement, finished BS degree in Biological Sciences.
54. May 2015 – July. 2015 Jewel Datri, undergraduate student, Louisiana State University, Agricultural and Mechanical College, Baton Rouge, LA, DHS HS-STEM Program, Improving the Chemical Mixture Methodology: Evaluating severity levels of respiratory irritants and their potential benefits, finishing BS degree in Biochemistry and Biophysics.
55. June 2015 – Aug. 2015 Kolyne DeJesus, undergraduate student, California State University, East Bay, Hayward, CA, NSF Robert Noyce Teacher Scholarship Program Improving the Chemical Mixture Methodology: Updating the CMM Wizard User's Guide and conducting test cases for CMM enhancement, finishing BS degree in Biology (Physiology).
56. June 2014 – Aug. 2014 Jessica M. Jablonski, undergraduate student, Saint Michael's College, Colchester, Vermont, DHS HS-STEM Program, Improving the Chemical Mixture Methodology: Evaluating severity levels of respiratory irritants and their potential benefits, finishing BS degree in Biological Chemistry.
57. June 2014 – Aug. 2014 Erin Griffin, undergraduate student, California Polytechnic State University, San Luis Obispo, NSF Robert Noyce Teacher Scholarship Program, Improving the

- Chemical Mixture Methodology: Updating the CMM Wizard User's Guide and conducting test cases for CMM enhancement, finishing BS degree in Physics and Mathematics.
58. May 2013 – Aug. 2013 Cassandra Nix, undergraduate student, Ashland University, Ashland, OH, DHS HS-STEM Program, Improving the Chemical Mixture Methodology: Evaluating severity levels of respiratory irritants and their potential benefits, Graduated with BS in Toxicology, now a doctoral student in molecular toxicology at Oregon State University.
 59. June 2013 – Aug. 2013 Holly Michelle Dixon, undergraduate student, University of Puget Sound, Tacoma, WA, DHS HS-STEM Program, Improving emergency preparedness: Reviewing respiratory irritants of hazardous chemicals to enhance the Chemical Mixture Methodology, graduated with BS in Chemistry, accepted with full scholarship by the molecular toxicology graduate program at Oregon State University.
 60. June 2013 – Aug. 2013 Skylar M. Folkens, undergraduate student, Wittenberg University, Springfield, OH, NSF Robert Noyce Teacher Scholarship Program, Enhancing chemical mixture methodology (CMM): Checking old test cases and conducting new ones with update HCNs, finishing BS with a teaching certificate.
 61. June 2013 – Aug. 2013 Hannah E. Fournier, undergraduate student, Wittenberg University, Springfield, OH, NSF Robert Noyce Teacher Scholarship Program, Updating the Chemical Mixture Methodology: Understanding the benefit of reassigning respiratory irritants, finishing BS with a teaching certificate.
 62. June 2012 – Aug. 2012 Lashaundra Ponder, undergraduate student, Clayton State University, Morrow, GA, DHS HS-STEM Program, Emergency preparedness: Testing and analyzing enhancements to the Chemical Mixture Methodology, applying for graduate school, graduated with BS in chemistry, now a MS student in chemistry at Kennesaw State University.
 63. June 2012 – Aug. 2012 Rebekah L. Coggin, undergraduate student, Calvin College, Grand Rapids, MI, DHS HS-STEM Program, Improving the chemical mixture methodology (CMM): Testing using Target Organ System Effect (TOSE) and Specific Target Organ Effect (STOE), graduated with BS in applied mathematics, now a doctoral student with full scholarship in applied mathematics at Kansas State University.
 64. June 2010 – Aug. 2010 Kimberly Allison Schutte, undergraduate student, Washington State University, Pullman, WA, NSF STAR intern and Noyce Scholar, Development of the CMM wizard for a user-friendly medium of the CMM Workbook, now a graduate student at University of Idaho majored in applied mathematics and MS intern in the statistics group at PNNL.
 65. June 2009 – Sept. 2009 Philip Bouslaugh, undergraduate student, Washington State University, Tri-cities, WA, DOE SULI Program, Assessment of Health Code Numbers, graduated with BS in Environmental Sciences.
 66. June 2007 – May 2008 John R. Mioduszewski, undergraduate, Edinboro University of Pennsylvania, DOE SULI Program, Seasonal variations of trace gases in Richland, WA, now a graduate student at Rutgers University.
 67. June 2007 – August 2007 Jace J. Bauer, undergraduate, Purdue University, DOE SULI Program, Characterization of the Sunset OCEC field analyzer, now at Univ. of Wisconsin-Madison, now a NSF Graduate Research Fellow at University of Wisconsin-Madison.
 68. June 2004 – August 2004 Ashley Hoffmeyer, undergraduate, Colorado State University, CSU Engineering Summer Undergraduate Internship Program, A laboratory study of the IMPROVE HNO₃ denuder efficiency, graduated with BS in chemical engineering.
 69. May 2005 – Dec. 2005 Alicia Evans, undergraduate, Dept. of Chemistry, Colorado State University, Various projects in atmospheric chemistry, graduated with BS in chemistry.

Co-mentored Post-doctoral Scientists and Students

70. May 2014 – Sept., 2016 Hee Joon Jung, postdoctoral fellow, PNNL, EED, In situ liquid SEM using SALVI, collaborating advisor: Jaehun Chun.

71. April 2014 – Sept., 2016 Li Fu, postdoctoral fellow, PNNL, EMSL, Sum frequency generation spectroscopy and applications using SALVI, collaborating advisor: Hongfei Wang.
72. May 2014 – Dec., 2016 David Lao, postdoctoral fellow, PNNL, EED, Nanocomposite particle synthesis using switchable ionic liquids, collaborating advisors: David Heldebrant and Satish Nune.
73. Sept. 2013 – present Hui Shi, postdoctoral fellow, PNNL, PMSD, Electrocatalysis for catalytic biomass conversion, collaborating advisor: Johannes Lercher.
74. April 2008 – June 2009 Hashim Ali, postdoctoral fellow, PNNL, BES, Determination of Henry's law constant of hydrogen peroxide in brine solutions, now an Assistant Professor at University of Arkansas State University, Jonesboro, AR, collaborating advisor: James Cowin.
75. Jan. 2015 – present Allen Warner Eyler, Ph.D. student, Washington State University, Pullman, WA, Material Sciences & Mechanical Engineering, Aerosol sampling and analysis, collaborating advisor: Katie Zhang.
76. Jun 2014 – August 2014 Marcus Tubbs, M.S. student, California State University, Long Beach, CA, NSF STAR Intern and Noyce Scholar, Microanalysis modeling of temperature programmed desorption in Matlab platform, collaborating advisor: Vassiliki (Vanda) Glezakou.
77. June 2014 – August 2014 Mariah T. Morey, DOE Community College Intern, Atmospheric dispersion models in emergency applications, collaborating advisor: Clifford Glantz.
78. October 2013 – present Abigail Tucker, Post Bachelor Intern, Correlative imaging of biofilms, collaborating mentor: Matthew Marshall.
79. Sept. 2014 – present Yufan Zhou, PNNL Alternative Sponsored Fellow, In situ liquid ToF-SIMS, collaborating mentor: Zihua Zhu.
80. March 2013 – Oct. 2014 Zhaoying Wang, PNNL Alternative Sponsored Fellow, In situ liquid ToF-SIMS of biological systems, collaborating mentor: Zihua Zhu.
81. June 2010 – Aug. 2010 Quintin Guigley, DOE PST undergraduate intern, Waste treatment plant stack monitor scale model testing and qualification, collaborating mentor: John Glissmeyer.
82. June 2010 – Aug. 2010 Marcia Parker, DOE intern, Development of the liquid ToF-SIMS, collaborating mentor: James Cowin.
83. April 2009 – June. 2009 Darrel Anderson, undergraduate student, University of Houston, Houston, Particulate measurements in SHARP, now a research assistant at University of Houston, collaborating mentor: Barry Lefer.
84. June 2009 – Aug. 2009 Crystal Silvia, high school intern student, PNNL, New particle formation observation on a mobile platform, collaborating mentor: James Cowin.

PUBLICATIONS AND PRESENTATIONS

Publications

Intellectual Properties

1. In operando heating and cooling with simultaneous chemical imaging, disclosure record number 31543, Leonard Pease, Xiao-Ying Yu and Jiyoung Son, Battelle IP report filed in March, 2019.
2. Separator assemblies and methods, disclosure record number 31482, Leonard Pease, Xiao-Ying Yu, Timothy Veldman, Matthew Fountain, Michael Minette, Carolynne Burns, Battelle IP report filed in Oct., 2018, US provisional patent submitted in Dec., 2018, US Patent App. (16/395,097) in April, 2019.
3. Universal liquid sample device and process for high resolution transmission electron microscope imaging and multimodal analyses of liquid sample materials, disclosure record number 31041E, Xiao-Ying Yu, Libor Kovarik, and Bruce Arey, Battelle IP report filed in October, 2016, US patent submitted in April, 2017, US Patent App. 15/483,939, and US patent US20170213692A1 issued on 4/12/2020.
4. In situ microfluidic reactor for correlative imaging and dynamic spectroscopy, disclosure record number 30767-E, Xiao-Ying Yu and Ryan Renslow, Battelle IP report filed in May, 2015.

5. Fast determination of state of charge of Vanadium redox flow battery by isotachopheresis, disclosure record number 30478-E, Xiao-Ying Yu, Bingwen Liu, Wei Wang, Zimin Nie, and Vince Sprenkle, Battelle IP report filed in September, 2013; provisional US patent to be filed on 3/31/2014.
6. Microfluidic electrochemical device and process for chemical imaging and electrochemical analysis at the electrode-liquid interface in situ, Battle disclosure record number E-30444, Xiao-Ying Yu, Bingwen Liu, Zihua Zhu, and Yang Li, US patent (14/050,144) was filed on 10/09/2013, and US patent (US20140038224 A1) published on 2/6/2014,
7. Systems and methods for analyzing liquids under vacuum, disclosure record number E-16961, Xiao-Ying Yu, Yang Li, James Cowin, Martin Iedema, and Zihua Zhu, Battelle IP report filed in January, 2011; Patent Cooperation Treaty (PCT, PCT/US2012/020136) was filed on 01/04/2013, published on 09/20/2012, and issued on 03/01/2016.
8. Systems and methods for analyzing liquids under vacuum, disclosure record number E-16961, Xiao-Ying Yu, Yang Li, James Cowin, Martin Iedema, and Zihua Zhu, Battelle IP report filed in January, 2011; US patent (US13/047,025) filed on 3/14/2011 and US patent 8,555,710 issued on 10/15/2013.
9. Fast Time-Resolved Aerosol Collector ("Fast-TRAC"), disclosure record number E-15752, James Cowin, Xiao-Ying Yu, and Hashim Ali, Battelle IP report filed in September 2007; provisional patent filed in December, 2007.

Book

10. In Situ Characterization of Catalytic Process in the Aqueous Environment, ISBN xxx-xxx-xx-xxxx-x, edited by X.-Y. Yu, World Scientific Publishing, p1-xxx, June, 2018.
11. Advances in Microfluidics: New Applications in Biology, Energy, and Materials Sciences, ISBN xxx-xxx-xx-xxxx-x, edited by X.-Y. Yu, INTECH open access publisher, p1-xxx, November, 2019.
12. Advances in Microfluidics: New Applications in Biology, Energy, and Materials Sciences, ISBN 978-978-953-51-2786-4, edited by X.-Y. Yu, INTECH open access publisher, p1-420, November, 2016. <http://www.intechopen.com/books/advances-in-microfluidics-new-applications-in-biology-energy-and-materials-sciences>
13. Municipal and Industrial Waste Disposal, ISBN 978-953-51-0501-5, edited by X.-Y. Yu, INTECH open access publisher, p1-242, April, 2012.

Book chapter

14. Xiao-Ying Yu, Chapter 27: Measurements of carbonaceous aerosols using semi-continuous thermal optical method, in Integrated Waste management/Vol. 1, ISBN 978-953-307-469-6, edited by Sunil Kumar, INTECH open access publisher, p521-538, August, 2011.
15. James Droppo and Xiao-Ying Yu, Chapter 11: Evaluation of replacing natural gas heat plant with a biomass heat plant: A technical review of greenhouse gas emission trade-offs, in Municipal and Industrial Waste Disposal, ISBN 978-953-51-0501-5, edited by X.-Y. Yu, INTECH open access publisher, p231-242, April, 2012. DOI: 10.5772/37517
16. Fei Zhang, Yao Fu, and Xiao-Ying Yu, Chapter 9: Microfluidics and interfacial chemistry in the atmosphere, in The Physical Chemistry of Gas-Liquid Interfaces, in Developments in Physical & Theoretical Chemistry series, ISBN 978-0-12-813641-6, edited by Jennifer Faust, Elsevier publisher, p245-270, 2018.
17. Sui Xiao and Xiao-Ying Yu, Chapter 14: Secondary ion mass spectrometry, in Surfaces and Interfaces in Multiphase Polymeric Systems: Micro to Nano Length Scales in Physical & Theoretical Chemistry series, ISBN 978-0-12-813641-6, edited by Jennifer Faust, Wiley publisher, pxxx-xxx, 2023. (FY2023)
18. Xiao-Ying Yu, Molecular imaging of Rhizobacteria and plant interactions, Updates on Rhizobacteria, ISBN: 978-1-83769-478-5, Nov., 2023, edited by Munazza Gull, Intech. (submission 06/21/2023)

Conference proceedings

19. *Jeffrey Collette, Jr., Taehyong Lee, Xiao-Ying Yu, Benjamin Ayres, Jackie Carrico, Sonia Kreidenweis, and William Malm*, Continuous measurement of PM_{2.5} ion concentrations at IMPROVE sites, Proceedings of the Air and Waste Management Association's Annual Meeting and Exhibition, 319-328, 2004.
20. *Jeffrey Collette, Jr., Taehyong Lee, Xiao-Ying Yu, Benjamin Ayres, and Sonia Kreidenweis*, Characterizing biases in speciation network measurements of fine particle ion concentrations, Proceedings of the Air and Waste Management Association's Annual Meeting and Exhibition, 161-172, 2004.
21. *Lowell L. Ashbaugh, Charles E McDade, Warren H. White, Paul Wakabayashi, Jeffrey L Collett, Jr., and Xiao-Ying Yu*, Efficiency of IMPROVE network denuders for removing nitric acid, Regional and Global Perspectives on Haze, 134, 671-678, 2004.
22. *Xiao-Ying Yu, * Li Yang, Zihua Zhu, Eugene E. Rodek, Theva Thevuthasan, and James P. Cowin*, In situ probing of IgG conjugated gold nanoparticles in liquids by SEM and ToF-SIMS, Microsc. Microanal. 19 (Suppl 1), 2048-2049, 2013.
23. *Xiao-Ying Yu, Kurtis P Recknagle, John A Glissmeyer, and J Matthew Barnett*, Integrating Modeling and Physical Testing for Assessing Filtered Exhaust Stack Sampling Probe Location. Health Physics 107(1):S30, 2014.
24. *Xiao-Ying Yu, * Zihua Zhu, Bingwen Liu, Matthew Marshall, Xin Hua, Zhaoying Wang, Li Yang, Abigail Tucker, William Chrisler, Eric Hill, Eugene E. Rodek, Theva Thevuthasan, Yuehe Lin, and James Cowin (Invited)*, Probing liquid surfaces and interfaces using time-of-flight secondary ion mass spectrometry, Proceedings of the Microscope and Microanalysis Society Meeting, Microsc. Microanal. 20 (Suppl 3), 2048-2049, 2014. Doi: 10.1017/S1431927614011970.
25. *Xiao-Ying Yu, * Multimodal imaging of environmental and biological liquid surfaces and interfaces using time-of-flight secondary ion mass spectrometry*, Proceedings of the Microscope and Microanalysis Society Meeting, Microsc. Microanal. 21 (Suppl 3), 2393-2394, 2015. Doi: 10.1017/S143192761501274X.
26. *Xiao-Ying Yu, * Bruce Arey, Hee Joon Jung, Libor Kovarik, Zihua Zhu, Tyler Troy, and Musahid Ahmed*, Correlative imaging and spectroscopy of particles in liquid, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 22 (Suppl 3), 220-221, 2016. Doi: 10.1017/S1431927616001951.
27. *Xiao-Ying Yu, * Bruce Arey, Zihua Zhu, Juan Yao, Fei Zhang, Sayandev Chatterjee, and Jaehun Chun*, In situ imaging and spectroscopy of particles in liquid, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 23 (Suppl 3), 882-883, 2017. Doi: 10.1017/S1431927616001951.
28. *Xiao-Ying Yu, * Juan Yao, Bruce Arey, Zihua Zhu, and Jaehun Chun*, In situ imaging and spectroscopy of boehmite particles under different pH conditions, Microsc. Microanal. 22 (Suppl 3), 220-221, 2017. Doi: 10.1017/S1431927617005074.
29. *Xiao-Ying Yu, * Rachel Komorek, Zihua Zhu, and Christer Jansson*, Imaging plant using time-of-flight secondary ion mass spectrometry, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 24 (Suppl 1), 1332-1333, 2018. Doi: 10.1017/S1431927618007146 (FY18 ended here)
30. *Xiao-Ying Yu, * Jenn Yao, Zihua Zhu, and Edgar Buck*, Analysis of radioactive materials in liquid using in situ SEM and ToF-SIMS, Proceedings of the International High-Level Radioactive Waste Management (IHLRWM) Conference, accepted on Feb. 10, 2019, on line published in April, 2019.
31. *Xiao-Ying Yu, * Jenn Yao, and Edgar Buck*, In situ and in operando liquid SEM of spent fuel materials, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 26 (Suppl 2), 1790-1792. Doi: 10.1017/S1431927620019352. (FY19 ended here)

32. Xiao-Ying Yu* and *Edgar Buck*, Capturing chemical dynamics at the buried electrode-electrolyte interface by in situ imaging mass spectrometry, Proceedings of the American Nuclear Society Meeting, on line published in Nov, 2019.
33. *Leonard F. Pease, Timothy G. Veldman, Jason Serkowski, Nathan R. Phillips, Richard C. Daniel, Michael J. Minette, Xiao-Ying Yu, Carolyn A. Burns*, Efficient Mesofluidic Separation of Large Particles in Nuclear Slurries, WM2020 Conference, March 8-12, 2020, paper 20408, Phoenix, Arizona, USA.
34. Xiao-Ying Yu,* Advancing correlative imaging of biological and irradiated materials, Proceedings of the Microscopy Society of Canada Meeting, on line published in June, 2020.
35. Xiao-Ying Yu,* *Jenn Yao, Sayan D. Chatterjee, Jiyoung Son, and Edgar Buck*, Studying the UO₂ Electrochemistry in situ using SEM, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 26 (Suppl 1), 1790-1791, 2020. Doi: 10.1017/S1431927620019352.
36. *Yanjie Shen, Jenn Yao, Jiyoung Son, Zihua Zhu, and Xiao-Ying Yu*,* Liquid ToF-SIMS revealing the oil, water, and surfactant interfacial evolution, The 31st Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2020.
37. *Yuchen Zhang, Rachel Komorek, Jiyoung Son, Zihua Zhu, Janet Jansson, Christer Jansson, and Xiao-Ying Yu*,* Evaluating the effect of PGPR on seedling growth potential using ToF-SIMS, The 31st Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2020.
38. *Jiyoung Son, Dehong Hu, George Bonheyo, and Xiao-Ying Yu*,* Interactions between synthetic bilgewater emulsion and biofilms, The 31st Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2020.
39. *Jenn Yao, Cuiyun Yang, Xiao-Ying Yu*,* Detection and identification of PFASs using ToF-SIMS and principal component analysis, The 31st Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2020.
40. *Wenchao Wei, Andrew Plymale, Zihua Zhu, Xiang Ma, Fanghua Liu, and Xiao-Ying Yu*,* Molecular insights into communications of Geobacter syntrophic communities, The 31st Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2020. (FY20 ended here)
41. *Leonard F. Pease, Jason Serkowski, Timothy G. Veldman, Jonathan Williams, Xiao-Ying Yu, Michael J. Minette, Carolyn A. Burns*, Can Bump Arrays Separate Particles from Turbulent Flows? Proceedings of the ASME 2021, Fluids Engineering Division Summer Meeting, FEDSM 2021-67696, art. no. V003T08A024, 2021. Doi: 10.1115/FEDSM2021-67696
42. Xiao-Ying Yu,* Multimodal imaging of oil-in-water bilgewater emulsion and biofilms, The 11th Interfaces Against Pollution Conference, Wuhan, Hubei, China, May 17, 2021.
43. *Yuchen Zhang, Jiyoung Son, Qiaoyun Huang, Wenli Chen, and Xiao-Ying Yu*,* To fix or not fix biofilms to study microbial soil aggregation, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 27 (Suppl 1), 1148-1149, 2021. Doi: 10.1017/S1431927621004335.
44. *Jiyoung Son, Xiao-Ying Yu*,* *Shawn L. Riechers, and Edgar C. Buck*, Making electrodes by particle stamping for microscopic and electrochemical analysis, Proceedings of the Microscopy and Microanalysis Society Meeting, Microsc. Microanal. 27 (Suppl 1), 2504-2505, 2021. Doi: 10.1017/S143192762100893X.
45. *Jiyoung Son, Edgar Buck, Shawn Riechers, and Xiao-Ying Yu*,* Making electrodes by particle stamping for microscopic and electrochemical analysis, The 32nd Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2021.
46. *Lyndi Strange, Xiao-Ying Yu*,* *Vaithiyalingam Shutthanandan, Miao Song, Jun Gao, Jiyoung Son, Yuchen Zhang, Ramprashad Prabhakaran, Kriston Brooks, and Vineet V. Joshi*,* Understanding the effect of surface treatment on the boehmite formation on aluminum 6061, The 32nd Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September, 2021.

47. *Yuchen Zhang, Jiyoung Son, Jason E. Baron, David J. Heldebrant, Roger Rousseau, and Xiao-Ying Yu**, Revealing the material interface compatibility between CO₂ separation membrane and water-lean solvents using ToF-SIMS, The 32nd Annual Symposium of the PNWAVS Sci. Tech. Society meeting, Richland, WA, September 2021. (FY21 ended here)
48. *Yanjie Shen, Jiyoung Son, Zihua Zhu, and Xiao-Ying Yu*, Capturing the Evolution of the Oil-in-Water Emulsion Interface by Correlative Imaging, Proceedings of the Microscopy and Microanalysis Society Meeting, Micro. Microanal., 28 (Suppl 1), 1348-1349, 2022. Doi: 10.1017/S1431927622005517.
49. *Xiao-Ying Yu, Bethany Matthews, Shawn Riechers, Steven R. Spurgeon, Zihua Zhu, Gary Sevigny, and Walter Luscher*, Multimodal Imaging of the Evolving Interface of Irradiated Aluminide-Coated Stainless-Steel Cladding, Proceedings of the Microscopy and Microanalysis Society Meeting, Micro. Microanal., 28 (Suppl 1), 996-997, 2022. Doi: 10.1017/S1431927622004317. [FY2022]
50. *Xiao-Ying Yu, Jiyoung Son, and Shawn Riechers*, Studying cerium oxide and uranium oxide using particle attached microelectrodes, TRANSAO 128 1-2023, ISBN: 0003-18X, Spring Meeting, 103-108, 2023.
51. *Xiao-Ying Yu*, Investigating tritium and lithium transport along the Tritium-Producing Burnable Absorber Rod, Proceedings of the Microscopy and Microanalysis Society Meeting, Micro. Microanal., 29 (Suppl 1), 1949-1950, 2023. Doi: 10.1093/micmic/ozad067.1009. [FY2023]
52. *Xiao-Ying Yu*, Exploratory Data analysis of long-term meteorological data at a DOE site for nuclear safety, American Nuclear Society Transactions, Winter Meeting, xxxx, 2023, Doi: xxxx. [FY2024]

Peer Reviewed Journal Articles

Papers in preparation (Papers are substantially written, pending data review or coauthor review)

53. *Xiao-Ying Yu*, * *Cliff Glantz, Richard Thomas, Achille J. Petrochhi, and Kevin A. Davis*, Refining the assignment of health code numbers of respiratory irritants, Journal of Applied Toxicology, TBD.
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263. *Xiao-Ying Yu, Xian-Zhen Yu, Chun-Yi Zhou, and Fan Ou-Yang*, Novel synthesis and characterization of spherical hydroxyapatite, **Progress in Biotechnology**. 16, 17, 1996. (1)

Invited Talks

1. *Xiao-Ying Yu*, In situ and in operando chemical imaging of biological, material, and environmental interfaces, MRS Fall, Boston, Nov., 2023.
2. *Xiao-Ying Yu*, Molecular imaging and analysis of materials using time-of-flight secondary ion mass spectrometry, CNMS Annual User Workshop, Oak Ridge, Aug. 18, 2023.
3. *Xiao-Ying Yu*, In situ and in operando molecular imaging of living biofilms, American Society of Microbiology, Houston, June 18, 2023.
4. *Xiao-Ying Yu*, In situ and operando imaging of dynamic interfaces, University of Tennessee, Knoxville, April 20, 2023.
5. *Xiao-Ying Yu*, Enhancing Risk Analysis of Accidental Release Using CFD Modeling and Machine Learning, DOE NRS&D EFOG Workshop, March 15, 2023 [FY23]
6. *Xiao-Ying Yu*, In situ molecular imaging of green solvents for CO₂ capture, CCST Virtual Conference, May 21, 2022.
7. *Xiao-Ying Yu*, In situ and in operando chemical imaging of biological, material, and environmental interfaces, virtual MRS Spring Conference, May 3, 2022.
8. *Xiao-Ying Yu*, In situ and in operando chemical imaging of biological, material, and environmental interfaces, Materials Sci. Eng. Departmental Seminar, University of Washington, Seattle, WA, April 15, 2022. [ORNL]
9. *Xiao-Ying Yu*, In situ molecular imaging of biological and environmental soft matter, Structural and Dynamic Characterization of Soft Matter section, The NSF Mathematics of Soft Matter Workshop, Chicago, IL, Feb. 28, 2022.
10. *Xiao-Ying Yu*, In operando molecular imaging of the electrode and liquid electrolyte interface, Catalysis and Chemical Engineering Conferences (CCE-2022), San Diego, CA, USA, online Feb. 26, 2022.
11. *Xiao-Ying Yu*, Multimodal imaging of solid-liquid interfaces, Enhancing Risk Analysis of Accidental Release Using CFD Modeling and Machine Learning, Virtual, DOE EFCOG Workshop, Feb. 25, 2022.
12. *Xiao-Ying Yu*, Dynamic multimodal chemical imaging of biological, environmental, and material interfaces, Physical Chemistry Seminar, Departmental of Chemistry, University of Washington, Seattle, WA, Feb. 14, 2022.
13. *Xiao-Ying Yu*, In situ molecular imaging of green solvents for CO₂ capture, XVth International Symposium on Environment, Catalysis and Process Engineering (ECGP), online, Nov. 23-25, 2021.
14. *Xiao-Ying Yu*, New Insights into Secondary Organic Aerosol Formation at the Air-Liquid Interface, 4th World Chemistry Conference and Exhibition (WCCE-2021), London, UK, online Nov. 04-06, 2021. [FY 22 starts here]
15. *Xiao-Ying Yu*, In situ molecular imaging of the air-liquid and solid-liquid interface of relevance to aerosol, 2021 EMLG/JMLG Workshop, online Sept. 13, 2021.
16. *Xiao-Ying Yu*, Multimodal imaging of oil-in-water bilgewater emulsion and biofilms, the 11th International Conference Interfaces Against Pollution (IAP2021), Wuhan, China, online May 14th, 2021.
17. *Xiao-Ying Yu*, Molecular imaging of biological, material, and environmental interfaces, University of Illinois at Urbana Champaign, Urbana Champaign, IL, online May 4th, 2021.
18. *Xiao-Ying Yu*, Advancing Correlative Imaging of Biological and Irradiated Materials, Canadian Microscopy Society meeting, Virtual, June, 2020.

19. Xiao-Ying Yu, Molecular imaging of biological, material, and environmental interfaces, AMES National Laboratory, Ames, IA, Jan., 2019.
20. Xiao-Ying Yu, Molecular imaging of biological, material, and environmental interfaces, NIST, Washington DC, Nov. 26, 2018.
21. Xiao-Ying Yu, In situ molecular imaging of Microbial Communities, ACS National Meeting, Boston, MA, August 19-23, 2018.
22. Xiao-Ying Yu, Towards elucidation of plant and bacteria interactions using in situ liquid SIMS, 25th CAARI, Grapevine, TX, August 12-17, 2018.
23. Xiao-Ying Yu, Molecular imaging of biological and environmental interfaces using liquid SIMS, SIMS USA, Richland, WA, June 19, 2018.
24. Xiao-Ying Yu, In situ molecular imaging of the air-liquid and the solid-liquid interface using microfluidics, Physical Chemistry Seminar, Dept. of Chemistry, University of Wisconsin, Madison, WI, Nov. 14, 2017.
25. Xiao-Ying Yu, In situ chemical imaging of the evolving material interface in liquid, SciX, Reno, NV, Oct. 11, 2017.
26. Xiao-Ying Yu, In situ molecular imaging of biointerfaces, Minnesota AVS Symposium, Minnesota, MN, Sept. 26, 2017.
27. Xiao-Ying Yu, In situ molecular imaging of the solid-liquid interface using microfluidics, SPECS GmbH, Berlin, Germany, Sept. 8, 2017.
28. Xiao-Ying Yu, In situ molecular imaging of the solid-liquid interface using microfluidics, 254th ACS National Meeting, Washington, DC, August 20-24, 2017.
29. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Fudan University, Shanghai, China, July, 2017.
30. Xiao-Ying Yu, In situ chemical imaging of biomolecules and biointerphases using microfluidics, East China University of Science and Technology, Shanghai, China, July, 2017.
31. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Shanghai Jiao Tong University, Shanghai, China, July, 2017.
32. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Plant Systems Biology Group, Partner Institute for Computational Biology (PICB), Chinese Academy of Sciences, Beijing, China, July, 2017.
33. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Institute of Geology and Geophysics, Chinese Academy of Sciences, Shanghai, China, July, 2017.
34. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Tsing Hua University, Beijing, China, July, 2017.
35. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Coastal Research Institute, Chinese Academy of Sciences, Yantai, Shandong Province, China, June, 2017.
36. Xiao-Ying Yu, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Coastal Research Institute, Ocean University of China, Qingdao, Shandong Province, China, June, 2017.
37. Xiao-Ying Yu, Chemical imaging of biological interfaces using microfluidics, 79th IUVESTA 3D Chemical Imaging Workshop, Sardinia, Italy, May 15-19, 2017.
38. Xiao-Ying Yu, In situ molecular imaging of the solid-liquid interface using microfluidics, JCAP Seminar Series, Lawrence Berkeley National Laboratory, April 2, 2017.
39. Xiao-Ying Yu, In situ molecular imaging of biological and energy interfaces, 6th China SIMS, Dalian, Liaoning, China, October, 2016.
40. Xiao-Ying Yu, In situ chemical imaging of biointerphases using microfluidics, SciX 2016, Minneapolis, MN, Sept., 2016.
41. Xiao-Ying Yu, In situ chemical imaging of biointerphases using microfluidics, IVC 2016, Busan, Korea, August, 2016.
42. Xiao-Ying Yu, In situ chemical imaging of biomolecules and biointerphases using microfluidics, Tsinghua University, Beijing China, June, 2016.

43. *Xiao-Ying Yu*, In situ chemical imaging of biomolecules and biointerphases using microfluidics, Beijing University, Beijing, China, June, 2016.
44. *Xiao-Ying Yu*, In situ chemical imaging of biomolecules and biointerphases using microfluidics, Southeast University, Nanjing, China, June, 2016.
45. *Xiao-Ying Yu*, In situ chemical imaging of biomolecules and biointerphases using microfluidics, Nanjing University, Nanjing, China, June, 2016.
46. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Fudan University, Shanghai, China, June, 2016.
47. *Xiao-Ying Yu*, In situ chemical imaging of biomolecules and biointerphases using microfluidics, East China University of Science and Technology, Shanghai, China, June, 2016.
48. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Huazhong Agriculture University, Wuhan, China, June, 2016.
49. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using microfluidics, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, Lanzhou, China, June, 2016.
50. *Xiao-Ying Yu*, In situ chemical imaging of biomolecules and biointerphases using microfluidics: Toward mesoscale imaging, Lab-on-a Chip Europe 2016, Madrid Spain, March, 2016.
51. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using microfluidics: Toward mesoscale imaging, In situ surface science (In situ SPM/TEM, XPS), 2015 SciX Conference, Providence, RH, September, 2015.
52. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using SALVI and liquid ToF-SIMS, In situ liquid SIMS, SIMS XX International Conference, Seattle, WA, September, 2015.
53. *Xiao-Ying Yu*, In situ chemical imaging of liquid surfaces and interfaces using SALVI, Proctor and Gamble, Cincinnati, OH, September, 2015.
54. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using time-of-flight secondary ion mass spectrometry, Chemical Processes at Environmental Interfaces Symposium, American Chemical Society National Meeting, Denver, CO, March, 2015.
55. *Xiao-Ying Yu*, In situ probing of environmental liquid surfaces and interfaces using microfluidics: Toward multimodal and mesoscale imaging, Department of Chemistry, University of California, Irvine, CA, February, 2015.
56. *Yu, Xiao-Ying*, In situ by ToF-SIMS, Probing of the electrode-electrolyte interface via a microfluidic reactor coupled with ToF-SIMS, Lab-on-a chip Congress, San Diego, September, 2014.
57. *Xiao-Ying Yu*, In situ probing of liquid surfaces and interfaces using time-of-flight secondary ion mass spectrometry, National Synchrotron Light Source Seminar series, Brookhaven National Laboratory, Upton, NY, August, 2014.
58. *Xiao-Ying Yu*, Probing liquid surfaces and interfaces using time-of-flight secondary ion mass spectrometry, Microscopy and Microanalysis 2014 Conference, Hartford, CT, August, 2014.
59. *Xiao-Ying Yu*, In situ imaging of liquids and interfaces by ToF-SIMS, CARRI 2014, San Antonio, TX, May, 2014.
60. *Xiao-Ying Yu*, Studying liquid interface in situ by ToF-SIMS, CARRI 2012 Conference, Fort Worth, TX, August, 2012.
61. *Xiao-Ying Yu*, Ozone and particulate matter formation in Houston, AQRP, Texas Commission on Environmental Quality, Austin, TX, July, 2010.
62. *Xiao-Ying Yu*, Free radical induced secondary aerosol formation, Science Advisory Committee Meeting, Houston Advanced Research Center, Houston, TX, October, 2008.
63. *Xiao-Ying Yu*, Aerosol chemical characterization using capillary electrophoresis, University of South Florida, School of Public Health, Tampa, FL, November, 2005.
64. *Xiao-Ying Yu*, Capillary electrophoresis in aerosol chemical characterization, Pacific Northwest National Laboratory, Fundamental Science Directorate, Richland, WA, November, 2005.
65. *Xiao-Ying Yu*, Aerosol anion characterization using PDMS based microchip capillary electrophoresis, University of California, Department of Chemistry, Davis, March, 2005.

66. Xiao-Ying Yu, Aerosol chemical characterization using URG, MOUDI and PILS in the 2003 special nitrate study at selected IMPROVE sites, Arkansas State University, Department of Chemistry, Jonesboro, January, 2004.
67. Xiao-Ying Yu, Evaluation of ammonium nitrate measurement in the IMPROVE network in four field experiments in 2003, University of Puerto Rico, Department of Chemistry, Mayaguez, Puerto Rico, December, 2003.
68. Xiao-Ying Yu, An overview of the IMPROVE/CSU nitrate characterization study, Texas A&M International University, Department of Chemistry, Laredo, TX, November, 2003.
69. Xiao-Ying Yu, The chemical kinetics of hydrogen peroxide photolysis in the acidic aqueous solutions containing chloride ions, Philip Morris and Quantum Resources, Richmond, VA, November, 2003.
70. Xiao-Ying Yu, The chemical mechanism of hydrogen peroxide photolysis in the acidic aqueous solutions containing chloride ions, University of California, Riverside, Department of Chemistry and Air Pollution Research Center, Riverside, CA, January, 2003.
71. Xiao-Ying Yu, Kinetics of Cl_2^- by laser flash photolysis of H_2O_2 and NaCl in the aqueous phase, Brookhaven National Laboratory, Atmospheric Sciences Division, Upton, NY, February 2001.
72. Xiao-Ying Yu, The kinetics study of Cl_2^- rise and decay by laser flash photolysis of H_2O_2 and NaCl in aqueous solutions, Pacific Northwest National Laboratory, Environmental Molecular Sciences Laboratory, Richland, WA, January 2001.
73. Xiao-Ying Yu, Kinetics of Cl_2^- by laser flash photolysis of $\text{S}_2\text{O}_8^{2-}$ and NaCl in aqueous solutions, Avery Dennison Corporation, Pasadena, CA, January 2001.
74. Xiao-Ying Yu, The determination and evaluation of rate constants and equilibrium constants of $\text{OH}+\text{Cl}^-$ system by laser flash photolysis of H_2O_2 and NaCl in the aqueous phase, Diatide Research Laboratories, a Division of Berlex Laboratories, Londonderry, NH, November 2000.
75. Xiao-Ying Yu, The chemical kinetics of $\text{OH}+\text{Cl}^-$ in the aqueous phase and its atmospheric implications, University of Toronto, Department of Chemistry, Toronto, Ontario, Canada, November 2000.

Talks

Presenting author of oral presentations in conferences

76. Xiao-Ying Yu, In situ molecular imaging of green solvents for CO_2 capture, M&M, Minneapolis, MN, July, 2023.
77. Xiao-Ying Yu, In situ molecular imaging of green solvents for CO_2 capture, ANS Spring meeting, Indianapolis, IN, June, 2023.
78. Xiao-Ying Yu, In situ molecular imaging of green solvents for CO_2 capture, 68th AVS, Pittsburg, PA, Nov. 2022.
79. Xiao-Ying Yu, Multimodal imaging of oil-in-water bilgewater emulsion and biofilms, SIMS International Conference, Minneapolis, MN, Sept. 2022.
80. Xiao-Ying Yu, To fix or not fix a biofilm, SIMS International Conference, Minneapolis, MN, Sept. 2022.
81. Xiao-Ying Yu, Multimodal imaging of oil-in-water bilgewater emulsion and biofilms, Microscopy & Microanalysis International Conference, Portland, OR, Aug. 2022.
82. Xiao-Ying Yu, Advancing multimodal imaging of the evolving interface of irradiated materials, Microscopy & Microanalysis International Conference, Portland, OR, Aug. 2022. [ORNL]
83. Xiao-Ying Yu, Advancing multimodal imaging of the evolving interface of irradiated materials, 67th AVS, virtual, Oct. 2021. [PNNL]
84. Xiao-Ying Yu, Multimodal imaging of oil-in-water bilgewater emulsion and biofilms, Colloid Div., ACS Fall meeting, Atlanta, GA, virtual, Aug. 2021. (FY21 ended)

85. Xiao-Ying Yu, *Jiyoung Son, Shalini Tripathi, Shawn L. Riechers, and Edgar C. Buck*, Using microfluidics to study spent fuel corrosion chemistry, Colloid Div., Nuclear Div., ACS Fall meeting, Atlanta, GA, virtual, Aug. 2021
86. Xiao-Ying Yu, *Richard Thomas, and Po-Yung Lu*, *PAC/TEEL – Moving into the future, EMISIG annual program review and presentations, Virtual, July, 2021*
87. Xiao-Ying Yu, *Brett Simpson, and Matthew Sturtevant*, *The CMM Wizard: An improved tool for consequence assessment, EMISIG annual program review and presentations, Virtual, July, 2021*
88. Xiao-Ying Yu, Direct electron transfer using in situ SIMS, Pacific AVS, Virtual, Sept. 2020. (FY20 ended)
89. Xiao-Ying Yu, Advancing multimodal imaging of the evolving interface of irradiated materials, Tritium Science and Technology Workshop, Virtual, Sept. 2020.
90. Xiao-Ying Yu, In situ and in operando chemical imaging of nuclear materials, Nuclear Energy Seminar Series at PNNL, June 11, 2020.
91. Xiao-Ying Yu, Studying the UO₂ electrochemistry in situ using SEM, M&M, virtual, August 2020.
92. Xiao-Ying Yu, Capturing Chemical dynamics at the buried electrode-electrolyte interface by in situ imaging mass spectrometry, ANS, DC, Dec. 2019
93. Xiao-Ying Yu, ToF-SIMS Imaging of plant seed interactions with plant-growth promoting bacteria, AVS, Columbus, OH, Oct. 2019
94. *Wenchao Wei and Xiao-Ying Yu*, Direct Interspecies Electron Transfer (DIET) in syntrophic microbes, AVS, Columbus, OH, Oct. 2019
95. Xiao-Ying Yu, In Operando molecular imaging of microbes as an electrode, 65th AVS, Columbus, OH, Oct. 2019
96. *Jiyoung Son and Xiao-Ying Yu*, Interactions between synthetic bilgewater emulsion and biofilms, AVS, Columbus, OH, Oct. 2019
97. Xiao-Ying Yu, *In situ* molecular imaging of syntrophic aggregates, Pacific AVS, Pullman, WA, Sept. 2019.
98. Xiao-Ying Yu, *In situ* molecular imaging of the air-liquid and liquid-liquid interface in the environment, ACS Fall 2019 National Meeting, San Diego, CA, Aug. 2019.
99. Xiao-Ying Yu, Detection of PFOA by sensitive ToF-SIMS, ACS Fall 2019 National Meeting, San Diego, CA, Aug. 2019.
100. *Yu, Xiao-Ying, Jenn Yao, and Edgar Buck*, Analysis of radioactive materials in liquid using in situ SEM and ToF-SIMS, Microscopy and Microanalysis of Nuclear and Irradiated Materials, Microscopy and Microanalysis Meeting, Portland, OR, August 2019.
101. *Yu, Xiao-Ying, Jenn Yao, Zihua Zhu, and Edgar Buck*, In operando SEM imaging of electrochemical oxidation of UO₂ in liquid, International High-Level Radioactive Waste Management Conference, Knoxville, TN, April 2019.
102. *Yu, Xiao-Ying*, In situ molecular imaging of microbial communities, 256th ACS National Meeting, Boston, MA, August 2018.
103. *Yu, Xiao-Ying*, In situ correlative imaging and spectroscopy of boehmite particles in liquids, Microscopy and Microanalysis Meeting, Baltimore, MD, August 2018.
104. *Yu, Xiao-Ying*, Imaging plants using time-of-flight secondary ion mass spectrometry, Microscopy and Microanalysis Meeting, Baltimore, MD, August 2018.
105. *Yu, Xiao-Ying, Juan, Yao, May-Lin Thomas, and Zihua Zhu*, Liquid analysis of radioactive materials using in situ ToF-SIMS, INMM Workshop, Richland, WA, May 2018.
106. *Yu, Xiao-Ying*, Chemical mapping of the evolving material interface of particles in liquids, 254th ACS Spring Meeting, New Orleans, LA, March 2018.
107. *Yu, Xiao-Ying*, Operando imaging of the transient species from electron transfer at the biointerface, 254th ACS Spring Meeting, New Orleans, LA, March 2018.
108. Xiao-Ying Yu, In situ multimodal imaging of microbial communities, 64th AVS National Meeting, Tampa, FL, November 2017
109. *Yu, Xiao-Ying*, In situ molecular imaging of biointerfaces by liquid SIMS, SIMS 21, Krakow, Poland, Sept. 2017.

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111. Xiao-Ying Yu, In situ chemical imaging of energy and environmental interfaces, 253rd ACS National Meeting, San Francisco, CA, April 2017.
112. Yu, Xiao-Ying, In situ chemical imaging of environmental liquid surfaces and interfaces using microfluidics and dynamic ToF-SIMS: Toward multimodal and mesoscale imaging, 63rd American Vacuum Society International Symposium and Exhibition, Nashville, TN, November 2016.
113. Yu, Xiao-Ying, In situ chemical imaging of biointerfaces using microfluidics, 2016 SciX Conference, Minneapolis, MN, September 2016
114. Yu, Xiao-Ying, Correlative imaging spectroscopy of particles in liquid, 2016 Microscopy & Microanalysis Conference, Columbus, OH, July 2016
115. Yu, Xiao-Ying, In situ chemical imaging of environmental liquid surfaces and interfaces using microfluidics and dynamic ToF-SIMS: Toward multimodal and mesoscale imaging, 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.
116. Yu, Xiao-Ying, In situ molecular imaging of hydrated biofilm using time-of-flight secondary ion mass spectrometry, Pacific Rim Symposium on Surfaces, Coatings, and Interfaces (PACSurf 2014), Kohala Coast, Hawaii, December 2014.
117. Yu, Xiao-Ying, In situ probing of liquid surfaces and interfaces by time-of-flight secondary ion mass spectrometry, 61st American Vacuum Society International Symposium and Exhibition, Baltimore, November 2014.
118. Yu, Xiao-Ying, Matthew Marshall, Bingwen Liu, Zhu, Zihua, Li Yang, Eric Hill, and Sarah Belchik, Imaging hydrated *Shewanella p.* biofilm in a microfluidic reactor by ToF-SIMS, Long Beach, CA, 60th American Vacuum Society International Symposium and Exhibition, October, 2013.
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121. Yu, Xiao-Ying, Clifford Glantz, Juan Yao, and Rocky Petrocchi, Enhancing the DOE chemical mixture methodology, EMISIG annual meeting, Chicago, IL, May, 2013.
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127. Schutte, Kimberly A, Rischel, Jeremy P, Glantz, Clifford S, Yu, Xiao-Ying, The CMM wizard: A web-based tool for consequence assessment in emergency, IEEE Emergency Preparedness and Response Topical Meeting, Knoxville, TN, August 2011.
128. Yu, Xiao-Ying, Berg, Larry K, Berkowitz, Carl M, Alexander, M Elizabeth, Lee, Yin-Nan, Ogren, John A., and Andrews, Betsy, Size Resolved CCN Composition and Cloud Properties in Cumulus Humilis, AMS Meeting, Seattle, January, 2011.

129. *Xiao-Ying Yu, Larry Berg, Carl M. Berkowitz, Elizabeth Alexander, Yin-Nan Lee, John Ogren, and Betsy Andrews*. Case studies of size resolved CCN composition in cumulus humilis, San Francisco, December 2010.
130. *Yu, Xiao-Ying; Cary, R.; Bauer, Jace J; Laulainen, Nels S; Berkowitz, Carl M*, Characterization of the Sunset Semi-Continuous Carbon Aerosol Analyzer, ASP Science Meeting, Santa Fe, NM, March, 2009.
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132. *Yu, Xiao-Ying and Petrocchi, Rocky*, Chemical Mixture Method and Health Code Number Update, Los Vegas, NV, May 2010.
133. *Petrocchi, Rocky and Yu, Xiao-Ying*, Chemical Mixture Method (CMM) Health Code Number (HCN) Update, San Francisco, CA, May 2009.
134. *Yu, Xiao-Ying*, Secondary and Primary Organic Carbon Downwind of Mexico City, China Meteorological Administration, Beijing, China, December 2009.
135. *Petrocchi, Rocky and Yu, Xiao-Ying*, CMM status, catch-up, and QA plans, Reston, VA, May 2008.
136. *Yu, Xiao-Ying; Iedema, Martin J; Cowin, James P*, Probing Aerosols in Cloud Microstructures with the Single Particle "Fast-TRAC", ARM AVP Workshop on Advances in Airborne Instrumentation, ARM AVP Workshop on Advances in Airborne Instrumentation, IL, October, 2008.
137. *X.-Y. Yu, J. Zheng, T. B. Onasch, M. R. Canagaratna, M. L. Alexander, J. Neece, R. Zhang, D. Worsnop, and C. M. Berkowitz*, Organic aerosol formation at Aldine, Texas, in the 2006 Houston Triangle Experiment, AMS National Meeting, New Orleans, LS, January 2008.
138. *X.-Y. Yu, H. Ali, M. Iedema, and J.P. Cowin*, Fast Time-Resolved Aerosol Collector – Fast TRAC, AGU Fall National Meeting, San Francisco, CA, Dec. 14, 2007.
139. *X.-Y. Yu, J. Zheng, M. L. Alexander, J. V. Ortega, R. Zhang, and C. M. Berkowitz*, A First Look at PTR-MS and AMS observations from the Aldine site of the Houston Triangle, DOE ASP FY 2007 Science Team Meeting, Boulder, CO, Oct. 25-27, 2006.
140. *Xiao-Ying Yu*, In-situ aerosol chemical characterization using Particle-Into-Liquid-Sampler and Ion Chromatography, Environmental Chemistry Division, ACS Fall National Meeting, Washington D. C., August, 2005.
141. *Taehyong Lee, Xiao-Ying Yu, Benjamin Ayres, Guenter Engling, Sonia Kreidenweis, and Jeffrey Collett, Jr.*, Characterization of particulate inorganic ions at selected IMPROVE sites, AGU Fall National Meeting, San Francisco, December 2004.
142. *Taehyong Lee, Xiao-Ying Yu, Benjamin Ayres, Jacqueline Carrillo, Christian Carrico, Sonia M. Kreidenweis, and Jeffrey L. Collett*, Characteristics of aerosol nitrate at several IMPROVE monitoring sites, AWMA fall annual meeting, Atlanta, GA, October 2004.
143. *Xiao-Ying Yu*, Kinetics of chlorine activation in the aqueous phase, 228th ACS National Meeting, Geochemistry Division, Philadelphia, PA, August 2004.
144. *Xiao-Ying Yu, Susanne Hering, Jeffrey L. Collett, Jr., and Charles Henry*, Characterization of low molecular weight carboxylic acids in atmospheric aerosols using capillary electrophoresis, State of Science Workshop on Organic Speciation in Atmospheric Aerosols Research, Las Vegas, NV, April 2004.
145. *Xiao-Ying Yu and John R. Barker*, The chemical equilibrium of $\text{Cl} + \text{Cl}^- \leftrightarrow \text{Cl}_2^-$ by laser flash photolysis in aqueous solutions containing chloride ions and hydrogen peroxide, Geochemistry Chemistry Division, 224th ACS National Meeting, Boston, MA, August 2002.
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148. Xiao-Ying Yu and *John R. Barker*, Chemical kinetics of some atmospheric free radical reactions in the aqueous phase, Department of AOSS, University of Michigan, Ann Arbor, MI, 1998.
149. Xiao-Ying Yu and *John R. Barker*, Quantum yield measurement of hydrogen peroxide in the aqueous phase by laser flash photolysis – The search for a suitable scavenger, Department of Atmospheric Oceanic and Space Sciences, University of Michigan, Ann Arbor, MI 1997.

Contributing author of conference oral presentations (including only corresponding author papers, up to 2018, needs updates)

1. *Jun Gao, Jiyoung Son, Yuchen Zhang, Zihua Zhu, David Heldebrant, Roger Rousseau, and Xiao-Ying Yu*, * Selecting a water-lean solvent for CO₂ capture using liquid ToF-SIMS, 67th AVS , Virtual, October 2021.
2. *Lyndi Strange, Xiao-Ying Yu, * Vaithiyalingam Shutthanandan, Jun Gao, Jiyoung Son, Yuchen Zhang, Ramprashad Prabhakaran, Kriston Brooks, and Vineet V. Joshi*, Understanding the effect of surface treatment on the boehmite scale formation on aluminum 6061, 67th AVS , Virtual, October. 2021.
3. *Jiyoung Son, Xiao-Ying Yu, * Shalini Tripathi, Shawn Riechers, and Edgar Buck*, Selecting a water-lean solvent for CO₂ capture using liquid ToF-SIMS, 67th AVS , Virtual, October. 2021.
4. *Jun Gao, Yuchen Zhang, Jiyoung Son, David Heldebrant, Roger Rousseau, and Xiao-Ying Yu*, * Studying the compatibility of CO₂ capture solvents and membrane using ToF-SIMS, Pacific AVS , Virtual, September 2021.
5. *Lyndi Strange, Xiao-Ying Yu, * Vaithiyalingam Shutthanandan, Jun Gao, Jiyoung Son, Yuchen Zhang, Ramprashad Prabhakaran, Kriston Brooks, and Vineet V. Joshi*, Understanding the effect of surface treatment on the boehmite scale formation on aluminum 6061, Pacific AVS , Virtual, September 2021.
6. *Yuchen Zhang, Jiyoung Son, Qiaoyun Huang, Wenli Chen, and Xiao-Ying Yu*, To fix or not fix biofilms to study microbial soil aggregation, M&M, Virtual, Aug. 2021
7. *Yuchen Zhang, Jiyoung Son, Qiaoyun Huang, Wenli Chen, and Xiao-Ying Yu*, * Studying the aggregation effect of microbes on mineral oxide and synthetic soil using ToF-SIMS, 67th AVS , Virtual, October. 2021.
8. *Jennifer Yao, Cuiyun Yang, and Xiao-Ying Yu*, * Detection and identification of PFASs mixtures using ToF-SIMS and principal component analysis, Pacific AVS, Virtual, Sept. 2020
9. *Yanjie Shen, Jenn Yao, Jiyoung Son, Zihua Zhu, and Xiao-Ying Yu*, * Liquid ToF-SIMS revealing the oil, water, and surfactant interfacial evolution, Pacific AVS, Virtual, Sept. 2020
10. *Jiyoung Son, Dehong Hu, George Bonheyo, and Xiao-Ying Yu*, * Interactions between synthetic bilgewater emulsion and biofilms, Pacific AVS, Virtual, Sept. 2020
11. *Juan, Yao, ..., Yu, Xiao-Ying*, In situ characterization of switchable ionic liquids by liquid SIMS, SIMS USA, Richland, WA, June 2018.
12. *Yu, Xiao-Ying*, In situ molecular imaging of microbial communities, 64th American Vacuum Society International Symposium and Exhibition, Tampa, FL, October 2017.
13. *Yu, Xiao-Ying*, In situ molecular imaging of biointerfaces by liquid SIMS, 21 SIMS International, Krakow, Poland, September 2017.
14. *Yu, Xiao-Ying*, In situ molecular imaging of biointerfaces using microfluidics, 63rd American Vacuum Society International Symposium and Exhibition, Nashville, TN, October 2016.
15. *Xiao Sui, Yufan Zhou, Jianmin Chen, Zihua Zhu, Yu, Xiao-Ying*, Glyoxal aqueous surface chemistry by SALVI and liquid ToF-SIMS, 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.
16. *Yuanzhao Ding, Juan Yao, Yufan Zhou, Bin Cao, Zihua Zhu, Yu, Xiao-Ying*, Investigating *Shewanella Oneidensis* biofilm matrix in a microchannel by in situ liquid ToF-SIMS, 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.

17. *Jiachao Yu, Yufan Zhou, Songqin Liu, Zihua Zhu, Yu, Xiao-Ying*, Understanding hydration of proteins by in situ liquid ToF-SIMS, 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.
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19. *Zihua Zhu, Yufan Zhou, Xin Hua, Jiachao Yu, James Evans, David Lao, Yu, Xiao-Ying*, Can in situ liquid SIMS provide enough signals for biology and environmental research? 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.
20. *Yufan Zhou, Xin Hua, Jiachao Yu, James Evans, David Lao, Yu, Xiao-Ying, Zihua Zhu*, Can in situ liquid SIMS provide enough signals for biology and environmental research? 62nd American Vacuum Society International Symposium and Exhibition, San Jose, October 2015.
21. *Zihua Zhu, Xiao-Ying Yu, Zhaoying Wang, Yufan Zhou, Bingwen Liu, Jiachao Yu*, In Situ molecular monitoring at the electrode-electrolyte interface using ToF-SIMS, International SIMS XX, Seattle, WA, September 2015.
22. *Zihua, Zhu, Xiao-Ying Yu, Zhaoying Wang, Bingwen Liu, Xin Hua, Li Yang, Matthew Marshall, Theva Thevuthasan, and James P. Cowin*, In situ analysis of biological and electrochemical interfaces using ToF-SIMS, Pacific Rim Symposium on Surfaces, Coatings and Interfaces (PacSurf 2014), Kohala Coast, HI, Dec. 2014.
23. *Xin Hua, Craig Szymanski, Zihua Zhu, James Evans, Songqin Liu, Galya Orr, and Xiao-Ying Yu**, Correlative imaging of mammalian cells in their native environments using a microfluidic reactor by ToF-SIMS and SIM, 61st American Vacuum Society International Symposium and Exhibition, Baltimore, November 2014.
24. *Xiao-Ying Yu, Kurt P Recknagle, John A Glissmeyer, and J Matthew Barnett*. 2014. Integrating Modeling and Physical Testing for Assessing Filtered Exhaust Stack Sampling Probe Location. Health Physics Society 59th Annual Meeting, Baltimore, MD on July 14, 2014.
25. *Zihua, Zhu, Li Yang, Xiao-Ying Yu, Martin J. Iedema, James P. Cowin*, In situ analysis of aqueous surfaces using ToF-SIMS, The International SIMS Conference, South Korea, Sept. 2013.
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27. *Zihua, Zhu, Li Yang, Xiao-Ying Yu, Martin J. Iedema, James P. Cowin*, Studying liquid surfaces under vacuum using ToF-SIMS, The ToF-SIMS Workshop, Pennsylvania, May 2012.
28. *Zihua, Zhu, Li Yang, Xiao-Ying Yu, Martin J. Iedema, James P. Cowin*, Probing liquid surfaces under vacuum using TOFSIMS, American Vacuum Society Meeting, October 2011.
29. *Cliff Glantz and Yu, Xiao-Ying*, The chemical mixture wizard is on line, EMISIG annual meeting, Chicago, IL, 2013.
30. *Cliff Glantz, Alex Booth, and Yu, Xiao-Ying*, The chemical mixture wizard: a new platform, EMISIG annual meeting, Seattle, WA, 2012.
31. *Yu, Xiao-Ying and Petrocchi, Rocky*, Chemical Mixture Method and Health Code Number Update, Charleston, NC, May 2011.
32. *Yu, Xiao-Ying, Jeremy Rishel, Kimberly Schutte, and Cliff Glantz*, The chemical mixture wizard, Charleston, NC, May 2011.
33. *Li Yang, Xiao-Ying Yu, Martin J. Iedema, Zihua Zhu, James P. Cowin*, Probing liquid surfaces under vacuum using SEM and TOFSIMS, ACS Spring National Meeting, Anaheim, CA, March 2011.
34. *Berkowitz, Carl M; Berg, Larry K; Ogren, John A.; Andrews, Elisabeth; Yu, Xiao-Ying; Lee, Yin-Nan*, Observations of Single Scattering Albedo Made during the 2007 Cumulus Humilis Aerosol Processing Study: size or composition? AMS Meeting, Seattle, January 2011.
35. *Lefer, Barry; Rappengluck, B; Olaguer, E P; Brune, W. H; Stutz, Jochen; Dibb, Jack E; Ren, Xinrong; Herndon, Scott C; Jobson, Bertram Thomas; Mount, George ; Yu, Xiao-Ying; Griffin, Robert; Thomas, Shelly; Shauck, Maxwell; Huey, L. G; Zhang, Renyi; Jimenez, Jose Luis*, First

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36. *C. M. Berkowitz, X.-Y. Yu, L. M. Alexander, J. V. Ortega, and T. B. Jobson*, Megacity Aerosol Experiment Texas Session, DOE ASP FY 2007 Science Team Meeting, Boulder, CO, Oct. 25-27, 2006.
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38. *Charles S. Henry, Carlos D. Garcia, Yan Liu, Jonathon C. Vickers, Guenter Engling, Xiao-Ying Yu, Jeffrey L. Collett*, Coupling electrochemistry with microchip electrophoresis: Analysis of aerosol particles, Electrochemical Society 2004 Joint International Meeting, Honolulu, Hawaii, October, 2004.
39. *Lowell L. Ashbough, Charles E. McDade, Warren H. White, Paul Wakabayashi, Xiao-Ying Yu, and Jeffrey L. Collett, Jr.*, Efficiency of IMPROVE network denuders for removing nitric acid, AWMA fall annual meeting, Atlanta, GA, October 2004.
40. *Jeffrey L. Collett, Jr., Taehyoung Lee, Xiao-Ying Yu, Benjamin Ayres, Jacqueline Carrillo, Christian Carrico, Sonia M. Kreidenweis and William Malm*, Continuous measurement of PM_{2.5} ion concentrations at IMPROVE sites, AWMA annual meeting, Saint Louis, MS, June 2004.
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42. *Jeffrey L. Collett, Jr., Taehyoung Lee, Xiao-Ying Yu, Sonia Kreidenweis, and William J. Malm*, On the speciation and measurement of aerosol nitrate in regional aerosols, AAAR annual fall meeting, Anaheim, CA, October 2003.

Posters (up to 2014)

1. *Xiao-Ying Yu (invited)*, SALVI: System for Analysis at the Liquid Vacuum Interface, R&D 100 Award Ceremony, Las Vegas, NV, November 2014.
2. *Xiao-Ying Yu, Li Yang, Zihua Zhu, Gene Rodek, Theva Thevuthasan, James P. Cowin*, In situ probing of IgG conjugated gold nanoparticles in liquids by SEM and ToF-SIMS, Microscopy and Microanalysis, Indianapolis, IN, August 2013.
3. *Xiao-Ying Yu, Li Yang, Zihua Zhu, Gene Rodek, James P. Cowin*, Enabling imaging of liquid surfaces by a microfluidic interface, Pittcon, Philadelphia, March 2013.
4. *Xiao-Ying Yu, Li Yang, Zihua Zhu, Gene Rodek, James P. Cowin*, In situ analysis of liquid surfaces by SEM and ToF-SIMS, Lab-on-a-chip World Congress, San Diego, CA, September 2012.
5. *Zihua, Zhu, Li Yang, Xiao-Ying Yu, Martin J. Iedema, James P. Cowin*, Fabrication of the in situ liquid interface suitable for vacuum detection, International ToF-SIMS, Italy, September 2011.
6. *Li Yang, Xiao-Ying Yu, Martin J. Iedema, Zihua Zhu, James P. Cowin*, A novel interface for vacuum liquid imaging using TOFSIMS, ASMS, Denver, CO, June 2011.
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8. *Yu, Xiao-Ying, Berg, Larry K, Berkowitz, Carl M, Alexander, M Elizabeth, Lee, Yin-Nan, Ogren, John A., and Andrews, Betsy*, Size Resolved CCN Composition and Cloud Properties in Cumulus Humilis, ASR Science Meeting, Austin, TX, March 2011.
9. *Yu, Xiao-Ying, Berg, Larry K, Berkowitz, Carl M, Alexander, M Elizabeth, Lee, Yin-Nan, Ogren, John A., and Andrews, Betsy*, Cloud Condensation Nuclei in Cumulus Humilis – Selected Case Study During the CHAPS Campaign, ASR Science Meeting, DC, March 2010

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11. Collett, Jeffrey L; Lee, Taehyoung; Beem, Katherine; Carrico, Christian M; Schurman, Misha; Chen, Xi; Schwandner, Florian; Raja, Suresh; Levin, Ezra; Yu, Xiao-Ying; Kreidenweis, Sonia M; Day, Derek E; Schichtel, Bret; Malm, William C; Tiggles, Mark; Sewell, H J; Molenar, John; Sherman, Lincoln; Archuleta, Cassie, Temporal and Spatial Variability in Concentrations of Atmospheric Ammonia in the Western United States, A&WMA Specialty Conference, Xi'An, China, 2010
12. Yu, Xiao-Ying, Berg, Larry K, Berkowitz, Carl M, Alexander, M Elizabeth, Lee, Yin-Nan, Ogren, John A., and Andrews, Betsy, Aerosol and Trace Gas Processing by Clouds During the Cumulus Humilis Aerosol Processing Study (CHAPS), AGU Annual Meeting, San Francisco 2008
13. Yu, Xiao-Ying; Scott, David C; Cowin, James P; Bernacki, Bruce E, In Situ Detection of Water Vapor with Telecommunication Laser Diode Absorption Spectroscopy (TLIDAS), ARM AVP Workshop on Airborne Instrumentation, Urbana-Champaign, IL, October 2008
14. J. Zheng, R. Zhang, X.-Y. Yu, and C. M. Berkowitz, VOC Measurements using PTR-MS during TexAQS II 2006, AMS national meeting, New Orleans, LS, January 2008
15. C. M. Berkowitz, M. L. Alexander, X.-Y. Yu, Y. Xie, and B. T. Jobson, A statistical overview of results from the Houston Triangle Campaign, AMS national meeting, New Orleans, LS, January 2008
16. M. Elizabeth Alexander, Xiao-Ying Yu, Matt Newburn, John Ortega, Tom Jobson, Jim Neece, John Jayne Douglas Worsnop, Timothy B. Onasch, Manjula Canagaratna, and Carl Berkowitz, Aerosol and Trace Volatile Organic Gas Measurements at Deer Park and Bayland Park in the 2006 Houston Triangle Experiment, AMS national meeting, New Orleans, LS, January 2008
17. S. Lance, L. Padro, A. Sullivan, R. Weber, A. Nenes, E. Cross, T. B. Onasch, D. Worsnop, X.-Y. Yu, M. L. Alexander, and J. N. Smith, Water-aerosol interactions downwind of Mexico City: Inferences about chemical composition and aging of ambient aerosol, AUG meeting, San Francisco, CA, December 2007
18. Chen Song, Rahul A. Zaveri, I, M. Elizabeth Alexander, Joel A. Thornton, Sasha Madronich, John V. Ortega, Xiao-Ying Yu, Alexander Laskin, Alla Zelenyuk, and David A. Maughan, Effect of hydrophobic primary organic aerosols on secondary organic aerosol formation from ozonolysis of α -pinene, AAAR meeting, Reno, NV, September 2007
19. Xiao-Ying Yu, Timothy B. Onasch, Nels S. Laulainen, M. Liz Alexander, Christopher Doran, Jerome Fast, Douglas Worsnop, Eben Cross, Pat Arnott and Carl M. Berkowitz, Particulate matter characteristics during transport between two ground sites in the 2006 MILAGRO Campaign, AAAR meeting, Reno, NV, September 2007
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